MONTHLY WEATHER REVIEW.

Editor: Prof. CLEVELAND ABBE.

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INTRODUCTION.

The REVIEW for September, 1895, is based on reports from 2,760 stations occupied by regular and voluntary observers, classified as follows: 149 from Weather Bureau stations; 35 from U. S. Army post surgeons; 2,416 from State Weather Service and voluntary observers; 34 from Canadian stations; 96 received through the Southern Pacific Railway Company; and 30 from U. S. Life-Saving stations; international simultaneous observations are received from a few stations and used together with trustworthy newspaper extracts and special reports.

The WEATHER REVIEW is prepared under the general editorial supervision of Prof. Cleveland Abbe. Unless otherwise specifically noted, the text is written by the Editor, but the statistical tables are furnished by the Division of Records and Meteorological Data, in charge of Mr. A. J. Henry, chief of that division. A special acknowledgment is made of the hearty cooperation of Prof. R. F. Stupart, Director of the Meteorological Service of the Dominion of Canada.

CLIMATOLOGY OF THE MONTH.

GENERAL CHARACTERISTICS.

The mean temperature was deficient in the extreme southern and northwestern borders, but throughout the greater part of the United States was decidedly above normal. The precipitation was in excess in Oregon and adjacent regions, but was deficient elsewhere. The accumulated precipitation shows a continuance of the drought in the Middle Atlantic, Ohio Valley, Lake, and adjacent regions. The rivers have continued at an unusually low stage of water. The principal storm of the month was that which passed over the Lake Region during the 28th and 29th. As a rule the month was free from general storms of any importance, but severe local storms occurred.

ATMOSPHERIC PRESSURE.

[In inches and hundredths.]

The distribution of mean atmospheric pressure reduced to sea level, as shown by mercurial barometers, not reduced to standard gravity, and as determined from observations taken daily at 8 a. m. and 8 p. m. (seventy-fifth meridian time), is shown by isobars on Chart II. That portion of the reduction to standard gravity that depends on latitude is shown by the numbers printed on the right-hand border.

The *mean pressures* during the current month were highest over the South Atlantic States, and were also high off the coasts of Washington and Oregon. The highest were: Charleston, 30.11; Knoxville and Chattanooga, 30.10; Fort Canby, 30.07. Mean pressures were lowest in Arizona, and were also low in the Canadian Provinces. The lowest were Battleford, 29.81; Yuma, 29.77.

As compared with the normal for September, the mean pressure was in excess on the south Atlantic and Gulf coasts and on the coasts of upper California, Washington, and Oregon. The greatest excesses were: Charleston, 0.05; New Orleans and Galveston, 0.04; Fort Canby, 0.06. Pressures were deficient over the northern parts of the interior; the greatest deficits were: Duluth and Port Arthur, 0.11; Winnipeg and Minnedosa, 0.10.

As compared with the preceding month of August, the pressures, reduced to sea level, show a fall in southern Florida, southern California, Washington, and in a small region in Montana, North and South Dakota, and Iowa, but a rise over the rest of the country. The maximum rises were: Washington and Northfield, 0.11; Boston, New Haven, New York, Philadelphia, Baltimore, Columbus, Ohio, Cincinnati, Indianapolis, and Louisville, 0.10. The greatest fall was Tatoosh Island, 0.08.

The *regular diurnal variation* in pressure is shown by the hourly means given in Table V for 28 selected stations out of 67 that maintain barograph records.

AREAS OF HIGH AND LOW PRESSURE.

[By Prof. FRANK H. BIGELOW.]

The tracks of eight areas of high pressure, including the subdivision to number VI, are plotted on Chart IV for the month of September. This chart shows that the centers of high areas linger more persistently near the coast lines than in any other portion of the United States. On the north Pacific Coast there is such an accumulation; also in the neighborhood of the south New England coast; a single high, No. III, hung near the Carolina coast for seven days (September 16 to 23), during which interval the eastern districts were maintained at unusually high temperatures, and a severe drought prevailed. With the exception of No. III, the tracks all lay north of the thirty-fifth parallel.

The tracks of nine low pressure areas are plotted on Chart I, and they are so strictly confined to the northern circuit, near the mean track, that, with one instance excepted (No. VII, for thirty-six hours), they all lie north of the fortieth parallel throughout their course. Six originated near the eastern edge of the high land or the Rocky Mountain Divide,

and two on the north Pacific Coast; all passed eastward over the Lake Region, five of them reaching the Gulf of St. Lawrence.

The month of September was dry, in general; the second half of the month was very warm east of the Mississippi River, though the districts of the Northwest were quite cool, if not below normal. During this period the eastward circulation was stagnant, and the high temperatures of the East were associated with this condition.

Movement of centers of areas of high and low pressure.

Number.	First observed.			Last observed.			Path.		Average velocities.	
	Date.	Lat. N.	Long. W.	Date.	Lat. N.	Long W.	Length.	Duration.	Daily.	Hourly.
High areas.		°	°		°	°	*Miles.*	*Days.*	*Miles.*	*Miles.*
I	1, a. m.	42	88	7, p. m.	47	60	2,210	6.5	340	14.1
II	4, p. m.	41	125	10, p. m.	41	72	3,730	6.0	622	25.8
III	11, a. m.	54	106	23, a. m.	35	78	3,640	12.0	303	12.6
IV	13, a. m.	38	134	15, a. m.	46	109	1,180	2.0	590	24.5
V	16, a. m.	42	125	17, p. m.	47	121	480	1.5	320	13.3
VI*a*	20, a. m.	41	124	25, p. m.	44	67	4,330	5.5	787	32.7
VI*b*.	23, a. m.	41	111	24, p. m.	45	122	630	1.5	420	17.4
VII	25, a. m.	47	124	29, p. m.	46	60	3,460	4.5	769	31.9
VIII	27, a. m.	50	123	30, p. m.	38	92	1,860	3.5	532	22.1
Sums							21,520	43.0	4,683	
Mean of 9 paths									520	21.6
Mean of 43.0 days									500	20.8
Low areas.										
I	1, a. m.	51	114	5, a. m.	50	88	1,380	4.0	345	14.3
II	4, a. m.	50	109	7, p. m.	47	73	2,380	3.5	680	28.2
III	7, p. m.	51	121	13, a. m.	47	62	3,210	5.5	584	24.2
IV	11, a. m.	41	124	14, a. m.	45	99	1,840	3.0	613	25.5
V	14, p. m.	54	107	19, a. m.	45	63	2,950	4.5	656	27.2
VI	17, a. m.	54	105	20, p. m.	49	90	1,710	3.5	489	20.3
VII	20, p. m.	39	104	24, a. m.	47	60	2,510	3.5	717	29.8
VIII	22, p. m.	52	114	27, p. m.	48	61	2,560	5.0	512	21.3
IX	27, a. m.	47	109	30, p. m.	48	66	2,380	3.5	680	28.2
Sums							20,920	36.0	5,276	
Mean of 9 paths									586	24.3
Mean of 36.0 days									581	24.1

HIGH AREAS.

I.—The month of September opened with a large high area covering the central valleys, the Atlantic States, and the Rocky Mountain Slope, central near the southern end of Lake Michigan. The barometer was relatively low over the Gulf of St. Lawrence and over the extreme northwestern districts, but there was no well-defined storm center in the rear of the high. Rain was falling along the Atlantic Coast from Maine to Florida, though the weather was fair in the interior. The temperature had fallen in the Lake Region and risen in the upper Missouri Valley. The high moved slowly eastward to the Virginia coast by the 2d, then northward to New England on the 3d, 4th, and 5th, and thence to the Gulf of St. Lawrence on the 6th and 7th. Its eastward progress was accompanied by light rains in the Gulf States from the 1st to the 3d. After that the rain area formed on the western side of the high in the Mississippi Valley, and crossed the Ohio Valley and the Middle States on the 4th, 5th, and 6th, and also the southern portion of New England, on the 7th. The temperature variations were all slight in the eastern districts during this time.

II.—This area of high pressure formed on the Pacific Coast in Oregon on the 5th, crossed the mountains in Washington on the 6th, moved to Iowa on the 7th, Pennsylvania on the 8th, and dissipated in New England on the 10th. Rain fell in the northern Rocky Mountain Plateau, as it advanced eastward, during the 5th and 6th; also showers occurred in the Gulf States on the 7th, on the south Atlantic Coast on the 8th, 9th, and 10th, but fair weather prevailed in most States during this period. A temperature fall of 10° to 20° accompanied the high in the mountain slope on the 6th. and in the Lake Region on the 7th. Frosts were reported in Montana, South Dakota, and Nebraska on the morning of the 7th, being the earliest of the season, but they did not extend eastward beyond the Missouri Valley.

III.—The next high area was one of remarkable duration, namely, from the 11th to the 23d. It commenced in Manitoba, moved down the Red River Valley to Lake Superior on the 13th, to the New Jersey coast on the 15th, to the South Carolina coast on the 16th, where it continued, with some uncertain motions, till the 23d. The formation of the high in Alberta produced showers in Montana and North Dakota on the 11th, but the weather became fair in front of the high till the 12th, p. m., when slight precipitation set in on the 13th in the Ohio Valley, but again cleared up in a few hours. After the high reached the Atlantic Coast, on the 15th, rain set in on its northwestern border, in the Lake Region, the low pressure configuration being poorly defined. This followed the southeastward movement of the high, and covered the Ohio Valley on the 16th, touching the Atlantic Coast on the 18th. A second area of rainfall passed along the northern border of this high on the 18th and 19th, falling for the most part in the Middle and the southern New England States. From the 11th to the end of the month a severe drought covered the States east of the Mississippi and south of the Ohio River, during which a moderately high barometer prevailed, with dry, hot winds from the south and southwest. Cooler air, with precipitation, passed eastward to the north of this high in a series of three waves, covering the Lake Region and the Middle and New England States, with the usual weather changes. The maximum temperatures ranged above 90° for several successive days (19th to 25th) in the south Atlantic and the Gulf States.

IV.—This high formed on the middle Pacific Coast during the 13th, crossed the mountains to Montana, where it disappeared on the 15th. It showed no noteworthy features.

V.—A feeble high covered the north Pacific Coast districts during the 16th and 17th, influencing the weather conditions inappreciably, except to produce a few light showers on the 16th.

VI.—This high formed on the middle Pacific Coast on the 20th, and, crossing the United States, arrived at the Atlantic Coast on the 25th. On the 22d it subdivided in Utah, the subordinate VI*b* passing northwest to the Pacific Coast on the 24th, while at the same time VI*a* was approaching the New England States. VI*a* passed to the Columbia River Valley on the 20th, to Utah on the 22d, Oklahoma on the 23d, Pennsylvania on the 24th, and Maine on the 25th; VI*b* moved from Utah on the 22d, Idaho on the 23d, and Oregon on the 24th. On the 21st and 22d a trough, with precipitation, formed in front of the high and covered the Missouri Valley, together with the south-central Slope. The rain advanced with the high and fell in the Mississippi Valley generally on the 23d, but the high passed eastward with no further rainfall of importance. Decided temperature falls occurred in the Rocky Mountain Region on the 20th, in the Missouri Valley on the 21st, the southern Slope on the 22d, the upper Mississippi Valley and the Lake Region on the 23d, and New England on the 24th, but failed to reach the heated territory south of the Ohio Valley. Killing frosts occurred in the Missouri Valley on the morning of the 23d, and in the Lake Region on the 24th.

VII.—This is another high area that traversed the United States. It formed in Washington on the 25th, moved to Nebraska on the 26th, Lower Michigan on the 27th, the mouth of the St. Lawrence River on the 28th, and Nova Scotia on the 29th. It caused some precipitation in the lower Mississippi Valley on the 26th, when it was central in Nebraska; also some frost in the lower Missouri Valley on

the 27th. Its passage eastward was marked by clear weather in all the districts east of the Mississippi on the 28th, with frosts in the lower Lake Region and Ohio Valley. On the 29th a low followed in its rear, with precipitation in the eastern Lake Region. Lower temperatures were experienced generally throughout the Northern States on the 26th, and these spread to the South Atlantic States and New England on the 28th.

VIII.—The last high area of the month originated in British Columbia on the 27th, and moved to eastern Montana on the 28th, eastern Nebraska on the 29th, and Missouri on the 30th, where it was at the end of the month. A low with limited precipitation formed in front of this high in the upper Missouri Valley on the 27th; the entire system drifted eastward; rain fell in the upper Mississippi Valley on the 28th, the eastern Lake districts on the 29th, and New England and the Middle States on the 30th. A decided fall of temperature took place on the mountain slope and the upper Mississippi Valley on the 28th, generally east of the Mississippi and also in the extreme Southwest on the 29th, and the Atlantic Coast States on the 30th. This high produced frosts in the lower Missouri Valley on the 29th, with an extensive frost area covering the upper Mississippi Valley, the Lake Region, and as far south as Kentucky on the 30th.

It may be noted that the tendency for rain to fall in showers in the midst of the high areas during the summer months is, in September, much more closely confined to the edges of the highs. Whenever two contiguous highs encounter each other the combined action generally causes cyclonic movements of the low areas with precipitation, but the fundamental causes of rainfall are doubtless harmonious throughout the year, whether the location of rain be in the midst of a high area or on its periphery, or in the region of the counterflow between the two adjacent highs. The inference to be drawn is, that lows are, on the whole, such formations as to be strictly dependent upon the previous existence of high areas.

AREAS OF LOW PRESSURE.

I.—The first center of low pressure for September appeared north of Montana near the one hundred and fifteenth meridian on the 1st, and moved to North Dakota on the 2d, to Lake Superior on the 4th, where it dissipated on the 5th. A few isolated showers occurred near the northern boundary, but the cyclonic area was generally dry till the 4th, when rain fell in the upper Mississippi and Ohio valleys on the 4th and 5th. This precipitation was so far to the southeast of the center as to be more properly referred to the high area to the east of it. The temperature changes were unimportant.

II.—The next low area appeared quite near the same place as the preceding one on the 4th; moved to Nebraska on the 5th, to Lake Superior on the 6th, and to the middle St. Lawrence Valley on the 7th, where it died away. This area was also quite dry till the 6th, when showers and thunderstorms occurred in the upper Mississippi Valley, which extended eastward to the Middle States on the 7th, in a limited area. This low had very little influence upon the local temperatures.

III.—The third area appeared to the north of Washington on the 7th, advanced to South Dakota by the 9th, to Wisconsin on the 11th, and then it moved rapidly to New Brunswick on the 12th, disappearing to the north of Nova Scotia on the 13th. Like many storms of this season its progress to the Mississippi Valley was nearly free from rainfall. On the 11th a general rain occurred in Montana and North Dakota, in the rear of the storm, at which time a high developed rapidly in that locality. Rain fell in the lower Lake Region and New England on the 12th after the center reached the St. Lawrence Valley. Some ground may be taken for the interpretation that this eastern part of the low track was to a considerable extent an independent formation. An area of warmer temperature followed the eastward movement of this low, with local rises of from 10° to 20°.

IV.—This low appeared on the California coast on the 11th, crossed the mountains near the Columbia River Valley on the 12th, and disappeared in South Dakota on the 14th. An extensive rain fell in the north Pacific States on the 11th to the 13th, the precipitation extending to the northern Plateau on the 14th. This storm had no influence on the weather conditions east of the Missouri Valley.

V.—The next low first appeared in Alberta on the 14th, and lingered for two days in the same vicinity. It then moved rapidly to Minnesota on the 17th, to New Jersey on the 18th, and disappeared in Nova Scotia on the 19th. This arrived in the Mississippi Valley without precipitation, three days after formation, after which its advance up the Ohio Valley and over New England was accompanied by quite heavy rains in Ohio, New York, and Pennsylvania, on the 18th and 19th, with some showers in southern New England.

VI.—Appeared in Alberta on the 17th, moved west to the Mountain Divide on the 18th, turned back to North Dakota on the 19th, and died out near Lake Superior on the 20th. Some rain fell to the north and west of the center on the 19th. During the 20th a second development took place in Kansas, being a part of the same trough of low area, which is described in the following number.

VII.—This center lingered near western Kansas during the 20th, 21st; moved to Lake Superior on the 22d; to the mouth of the St. Lawrence on the 23d, breaking up in the Gulf on the 24th. It carried a long area of precipitation over the Missouri and Mississippi valleys on the 21st, 22d, and 23d, though in many instances the showers were very light. The usual slight temperature changes followed its movements.

VIII.—This appeared first in Alberta on the 22d, moved slowly eastward to Lake Superior by the 26th, and then very rapidly to the Gulf of St. Lawrence by the 27th. This showed the same characteristic position of the rain, as regards the center, seen in cyclonic areas of the Northwest, viz, a fall to the rear (24th and 25th), followed by a sudden transferrence to the front (26th), in the Ohio Valley, while the storm was central over the upper Lakes. On the 26th thunderstorms were general in Missouri and the lower Lake Region. The passage of this area was attended by an average increase of 10° to 15° in temperature in the northern belt.

IX.—This low formed in Montana on the 27th, moved to upper Michigan on the 28th, and to New Brunswick on the 30th. In this case light precipitation adhered quite closely to the central portions of the area of depression throughout the movement, except on the 30th, when it extended southward into the middle Atlantic States. The changes in temperature were insignificant.

X.—The last low appeared in Alberta on the 29th and was in the Red River Valley on the 30th, at the end of the month. No features of interest developed.

The month of September was one of unusual quietness as regards the atmospheric circulation. No hurricane developed in the West Indian region; the Southern States were not visited by any storm; and the movements of highs and lows in the northern circuit were very simple.

LOCAL STORMS.

By Mr. A. J. HENRY, Chief of Division of Records and Meteorological Data.

On the afternoon and night of the 3d, a heavy rain, generally accompanied by wind, lightning, and hail, fell over central Indiana and Illinois, eastern Missouri, and southeastern Iowa. At Indianapolis the losses by floods were estimated as high as $100,000, exclusive of injury to public works. Nearly 7 inches of water fell within eleven hours. Business streets were flooded and families rescued from drowning by the

police. At many other towns the rain was heavy. In the country districts corn was swept to the ground, outbuildings were leveled, farm animals drowned and killed by lightning, which also destroyed stacks and barns. At Peoria, Ill., the storm was mentioned as the most severe of many years. At Bloomington the rainfall during the night exceeded 6 inches; sewers were choked and streets and basements overflowed; in the vicinity cattle were killed and buildings and stacks burned by lightning. At New London, Mo., hail fell during nearly two hours; some of the masses weighed 8 ounces, and the destruction of glass was large. At Clinton, Iowa, and in the surrounding country the storm was furious, and the losses by hail and lightning were serious.

From the evening of the 3d to the morning of the 4th an area of low pressure covered the northern Lakes, while a subsidiary depression covered Kansas. These two disturbances changed their relative positions but little during the continuance of the rainstorms above described.

On the 6th, at Baltimore, occurred the heaviest rainfall that had visited that city in twenty-five years. From 2 o'clock a. m. to 6 o'clock p. m., there was little cessation. For the sixteen hours the record of precipitation was 4.76 inches. Streets were flooded, one woman and a team of horses were drowned, and buildings thrown down and made dangerous by the undermining of the foundations. There was little wind and no thunder or lightning. The damages are roughly estimated at $100,000. A cloudburst near Glenn Falls Station, 23 miles from the city, carried away the railroad embankment for a long distance, and made the west branch of the Patapsco (ordinarily a few feet in width) a torrent an eighth of a mile wide, which inundated fields and destroyed the crops for several miles along the valley of the river.

The excessive precipitation above referred to was not confined to Baltimore alone, but was common to a considerable portion of Maryland. In Washington, and elsewhere on the borders of Maryland, the rainfall was light.

On the afternoon of the same day the worst storm of wind, rain, thunder, and lightning visited Joplin, Mo., that the town had experienced since 1875. Streets and houses were flooded and occupants of the latter driven out, a large water main was burst, mines were filled, and trains could not reach the city over the submerged tracks for several hours. Similar storms prevailed at Macon, Mo., Girard and Fort Scott, Kans., St. Paul, Minn., and Water Valley, Miss. In the vicinity of the latter town serious damage was done to corn and cotton.

In the afternoon of the 8th southeastern Kansas was swept by a wind and rain storm of almost unprecedented force; several lives were lost and much property destroyed. In Gridley, Coffey County, a village of 400 inhabitants, many of the best buildings were wrecked and but four were uninjured. This was the work of the wind, and the contents of the ruined structures were quickly soaked by rain. The storm raged from the north to the line of the county, destroying churches, houses, barns, and granaries. At Emporia, a wing of the State Normal School was ruined, entailing a loss of $25,000. Considerable injury was also wrought to business buildings. The rainfall during the night is reported at 8 inches. The Neosho Valley for ten miles above Emporia was flooded, fields of shocked corn and thousands of tons of hay in stacks were washed away and the inhabitants driven to higher ground. Elk City was inundated, houses were washed away and hundreds left homeless. Neosho Rapids was flooded and fine business structures were ruined. Fort Scott, Fredonia, Independence, and many smaller towns and their surrounding farms suffered severely. In seven counties buildings, railroads, and highways were injured.

It may be added that in the three storm periods thus far described the greatest destruction by wind, rain, and lightning occurred in a region far removed from the area of least pressure, commonly known as the storm centre.

On the 11th Cape Vincent, N. Y., experienced a terrific storm, attended by thunder and lightning. The railroad roundhouse and station were blown down killing 2 persons and injuring 14 others. Several business blocks were unroofed, buildings were set on fire by lightning, and rain washed away roads and flooded cellars. A similar, though less destructive storm, prevailed at Watertown, a few miles distant. At and near Turner's Falls, Massachusetts, "a cloudburst of hail" covered the ground to a depth of 2 feet with hailstones, many of them "as large as a man's fist." In a territory about 1 mile by 6, windows were riddled and all exposed vegetables destroyed. Duluth, Minn., and vicinity was also visited by a rainstorm reported to be the heaviest ever before known in that locality.

On the 10th, 11th, and 12th, rain fell in a dozen California counties largely devoted to the cultivation of grapes, prunes, and apricots. The storm was unexpected, being unusually early, and threatened to damage both wine and raisin grapes, and all drying fruit. But the unfavorable conditions were not lasting and serious losses did not follow.

At Madison, Wis., on the 15th, a purely local wind overturned a train of empty freight cars, injuring three men seriously. Large trees were uprooted and other small damages resulted. A similar storm accompanied by rain, was reported from Chicago. Small craft on the lake were endangered and 2 lives were lost. The rainfall for an hour was violent, and lightning did slight damage.

The storm that prevailed along the Lake region, excepting Lake Michigan, on the night of the 17th, was exceedingly violent over Michigan counties bordering on Lake Huron. In Huron county 2 children were killed by the falling of a house torn to pieces by wind, and the destruction of buildings reached many thousand dollars without considering the losses of live stock, fences, standing grain, telephone lines, and trees. At Huron City the storm was "the heaviest ever known by the oldest inhabitant." In the counties of Charlevoix, Grande Traverse, Kalkaska, Emmet, and Alpena, the damage wrought was also extensive, though no lives were lost. In Grande Traverse county, fruit orchards, maple sugar bushes, and an 80-acre tract of timber were swept almost clear of trees. Late in the evening a furious storm burst upon Pittsburg. It lasted less than half an hour, but in that period wind and lightning had killed 2 persons and destroyed much valuable property. An immense grain elevator was wrecked, loss $20,000, and scores of smaller buildings were demolished. Damages to boating were estimated at $10,000.

This storm passed rapidly eastward, the rain front reaching the Atlantic Ocean twenty-four hours after the appearance of the storm centre in North Dakota.

In its progress eastward a condition favorable to the development of tornadoes was apparently reached in several portions of its path, especially in central Michigan and in the vicinity of New York City. At the last named place pressure fell two-tenths of an inch in fifteen minutes, the wind suddenly shifted from southeast to south and increased from 8 to 48 miles per hour; it soon backed to southeast then to northeast and north with diminishing velocity. Marked fluctuations of pressure were also observed at Albany, Philadelphia, Baltimore, and Washington. At the two stations last named thunderstorms occurred, beginning at 9.15 and 9.40 a. m., respectively, and the barometric changes were those characteristic of thunderstorms. At the other stations named, however, the barograph curve formed almost a perfect V. While light rain fell there were no thunderstorms. The rain front continued to move eastward through Connecticut and Massachusetts, although the eastward progress of thunderstorms was apparently stopped on a line parallel with the

Hudson River. Other unusual features in connection with the progress of this storm eastward from central Michigan were the continuance of thunderstorms throughout the night hours, and the termination of all thunderstorm activity during the daytime of the 18th, at a time when the local heat, due to sunshine, would appear to have been favorable to their continuance.

On the 20th a snowfall of two inches, and continuing at 8.30 p. m., was reported at Deadwood, S. Dak.; Lander, Wyo., where it continued until 8 o'clock, p. m., of the 21st; and at Ogden, Utah.

Snow fell quite generally over Colorado on the night of the 21st, reaching a depth of from 4 to 12 inches. Serious injury was done to fruit trees by breaking the limbs. Most of the fruit was saved. During the night snow also fell in western Nebraska.

On the night of the 22d a violent storm destroyed property, mostly on farms, estimated in value at $35,000, in the Wisconsin counties of Lincoln and Eau Claire. Other sections of the State also suffered badly in the demolition of houses and telegraph lines. At Oconto the storm is reported as the most severe since 1871. On the same night a wind storm damaged miscellaneous property valued at $10,000 in Menominee, Mich., and at Alpena, Mich., the wind registered a velocity of 71 miles.

Destructive gales swept over Lakes Superior, Huron, and Michigan on the 28th and 29th. Their coming had been forecast by the United States Weather Bureau office, at Chicago, and serious losses were doubtless thereby prevented. Snow fell in Michigan on the 29th to the depth of several inches in many localities on the upper peninsula, and at a few points in the southern part of the State. Snow was also reported at Lima, Ohio, and at Altoona and Philadelphia, Pa.

TEMPERATURE OF THE AIR.

[In degrees Fahrenheit.]

The mean temperature is given for each station in Table II, for voluntary observers. Both the mean temperatures and the departures from the normal are given in Table I for the regular stations of the Weather Bureau.

The *monthly mean temperature* published in Table I, for the regular stations of the Weather Bureau, is the simple mean of all the daily maxima and minima; for voluntary stations a variety of methods of computation is necessarily allowed, as shown by the notes appended to Table II.

The *regular diurnal period* in temperature is shown by the hourly means given in Table IV for 29 stations selected out of 82 that maintain continuous thermograph records.

The *distribution* of the monthly mean temperature of the air over the United States and Canada is shown by the dotted isotherms on Chart II; the lines are drawn over the high irregular surface of the Rocky Mountain Plateau, although the temperatures have not been reduced to sea level, and the isotherms, therefore, relate to the average surface of the country occupied by our observers; such isotherms are controlled largely by the local topography, and should be drawn and studied in connection with a contour map. The highest mean temperatures were: Yuma, 84.2, and Key West, 82.0. The lowest mean temperatures were: in the United States, Port Crescent, 49.1, and in Canada, Calgary, 42.6.

As compared with the normal for September, the mean temperature for the current month was deficient in the extreme southern part of the Florida Peninsula, and in the Pacific Coast, northern Rocky Mountain, and northern Slope regions. The largest excesses were: Dubuque, 7.4; La Crosse, 7.2; Omaha, 6.8; Concordia, 6.5; Wichita and Topeka, 6.2; Des Moines and Columbus, Ohio, 6.0. The greatest deficits were: Walla Walla, 7.0; Calgary, 6.9.

Considered by districts the mean temperatures for the current month show departures from the normal as given in Table 1. The greatest positive departure was Upper Mississippi, 5.5. The greatest negative departure was northern Plateau, 4.0.

The years of highest and lowest mean temperature for September are shown in Table I of the REVIEW for September, 1894. The mean temperature for the current month was the highest on record at: Harrisburg, 69.6; La Crosse, 67.6; Dubuque, 69.8; Des Moines, 69.4; Omaha, 71.2; North Platte, 67.4; Concordia, 73.4; Topeka, 73.1; Dodge City, 72.7; Wichita, 75.2; Kansas City, 73.2; Parkersburg, 73.0; Lexington, 72.8; Raleigh, 75.9; Knoxville, 74.8; Nashville, 75.9; Memphis, 77.8; Little Rock, 78.0; Chattanooga, 75.3; Columbia, 77.6; Atlanta, 76.5; Montgomery, 80.0; Pensacola, 80.6; Mobile, 80.7; New Orleans, 81.7; Palestine, 80.5. It was the lowest on record at: Port Angeles, 50.7; Walla Walla, 58.3; Astoria, 56.2; Roseburg, 57.2; Carson City, 54.8.

The *maximum and minimum temperatures* of the current month are given in Table I. The highest maxima were: Yuma, 107 (7th); Concordia, 104 (16th); Huron and Sioux City, 103 (17th); Omaha, 102 (17th); Pierre, (9th), North Platte, (17th), 101; Rapid City (13th), Dodge City (5th), Wichita and Palestine (12th), 100. The lowest maxima were: Port Angeles, 62 (28th); Tatoosh Island, 64 (28th); Pysht, 65 (1st); Port Crescent, 66 (28th); East Clallam, 67 (28th). The highest minima were: Key West, 71 (10th); Titusville, 70 (18th); Jupiter, 68 (4th); Tampa (17th), and Port Eads (30th), 66. The lowest minima were: Lander, 7 (22d); Winnemucca, 16 (22d); Williston, 17 (29th); Havre and Carson City, 18 (22d); Idaho Falls, 19 (22d).

The *limit of freezing weather* is shown on Chart VI by the isotherm of minimum 32°, and the limit of frost by the isotherm of minimum 40°.

The years of highest maximum and lowest minimum temperatures are given in the last four columns of Table I of the current REVIEW. During the present month the maximum temperatures were the highest on record at: Northfield, 90; Albany, 97; Nantucket, 86; New London, 93; Woods Hole, 84; Vineyard Haven, 91; Harrisburg, 94; Lynchburg, 99; Norfolk, 100; Cape Henry, 96; Hatteras, 90; Wilmington, 96; Raleigh, 98; Charlotte, 98; Port Huron, 94; Cincinnati, 95; Lexington, 95; Parkersburg, 96; Columbia, 96; Palestine, 100; Dodge City, 100; Concordia, 104; Denver, 96; Cheyenne, 90; North Platte, 101; Omaha, 102; Rapid City, 100; Huron, 103; St. Paul, 96; La Crosse, 97; Green Bay, 95; Dubuque, 97; Bismarck, 96. The minimum temperatures were the lowest on record at: Tampa, 66; Shreveport, 44; Fort Smith, 37; Springfield, Mo., 37; Springfield, Ill., 36; Kansas City, 37; Topeka, 33; Concordia, 29; Wichita, 34; Dodge City, 30; Pueblo, 28; Denver, 27; Cheyenne, 20; Salt Lake City, 29; Lander, 7; Miles City, 22; Williston, 17; Havre, 18; Helena, 26; Walla Walla, 36; Portland, Oreg., 36; Astoria, 40; Eureka, 36; Winnemucca, 16; Carson City, 18; Fresno, 44.

The greatest daily range of temperature and the extreme monthly range are given for each of the regular Weather Bureru stations in Table 1, which also gives data from which may be computed the extreme monthly ranges for each station. The largest values among the greatest daily ranges were: Miles City, 56; Moorhead, 54; Williston, 53; Winnemucca, 49; Lander, Pueblo, and Carson City, 48. The smallest values were: Corpus Christi, 13; Hatteras, 14; Galveston and Port Eads, 15; Key West and Titusville, 17; Jupiter and Woods Hole, 18; Kittyhawk, 19; Charleston and Tatoosh Island, 20. Among the extreme monthly ranges the largest values were: Lander and Huron, 81; Williston, 78. Sioux City, 76; Concordia and North Platte, 75. The smallest values were: Key West, 19; Titusville, 20; Jupiter, 21; Tatoosh Island, 24; Tampa and Port Eads, 25; Corpus Christi, 26.

The *accumulated monthly departures* from normal temperatures from January 1 to the end of the current month are given in the second column of the following table, and the average departures are given in the third column, for comparison with the departures of current conditions of vegetation from the normal conditions.

Districts.	Accumulated departures.		Districts.	Accumulated departures.	
	Total.	Average.		Total.	Average.
	°	°		°	°
New England	+ 0.1	0.0	Middle Atlantic	− 5.5	− 0.6
Upper Lake	+ 4.9	+ 0.5	South Atlantic	−13.4	− 1.5
North Dakota	+ 6.2	+ 0.7	Florida Peninsula	−12.8	− 1.4
Upper Mississippi	+ 3.4	+ 0.4	East Gulf	−14.9	− 1.7
Missouri Valley	+ 5.9	+ 0.7	West Gulf	−14.2	− 1.6
Northern Plateau	+ 1.0	+ 0.1	Ohio Valley and Tenn.	− 8.0	− 0.9
			Lower Lake	− 1.5	− 0.2
			Northern Slope	−10.0	− 1.1
			Middle Slope	− 2.7	− 0.3
			Abilene (southern Slope)	−13.7	− 1.5
			Southern Plateau	− 7.1	− 0.8
			Middle Plateau	−12.1	− 1.3
			North Pacific	− 3.0	− 0.3
			Middle Pacific	− 4.9	− 0.5
			South Pacific	− 8.9	− 1.0

MOISTURE.

The *quantity of moisture* in the atmosphere at any time may be expressed by means of the weight contained in a cubic foot of air, or by the tension or pressure of the vapor, or by the temperature of the dew-point. The mean dew-points for each station of the Weather Bureau, as deduced from observations made at 8 a. m. and 8 p. m., daily, are given in Table I.

The *rate of evaporation* from a special surface of water on muslin at any moment determines the temperature of the wet-bulb thermometer, but a properly constructed evaporometer may be made to give the *quantity* of water evaporated from a similar surface during any interval of time. Such an evaporometer, therefore, would sum up or integrate the effect of those influences that determine the temperature as given by the wet bulb; from this quantity the *average humidity of the air* during any given interval of time may be deduced.

The *sensible temperature* experienced by the human body and attributed to the atmosphere depends not merely upon the temperature of the air, but equally upon the dryness, the velocity of the wind, and the suddenness of atmospheric changes. The temperature of the wet-bulb thermometer as obtained by the whirling apparatus used in the shaded shelter corresponds to the temperature felt by persons standing in the shade of trees or houses, exposed to a natural breeze of at least 6 miles per hour. This temperature and its depression below the dry bulb are the fundamental data for all investigations into the relations between human physiology and the climate. In order to present a monthly summary of the atmospheric conditions from a hygienic and physiological point of view, Table VIII has been prepared, showing the maximum, minimum, and mean readings of the wet-bulb thermometer at 8 a. m. and 8 p. m., seventy-fifth meridian time.

PRECIPITATION.

[In inches and hundredths.]

The *distribution of precipitation* for the current month, as determined by reports from about 2,500 stations, is exhibited on Chart III. The numerical details are given in Tables I, II, and III.

The precipitation was heaviest, 4.00 to 10.00 in the upper Lake Region, 4,00 to 9.00 in the Florida Peninsula, and 4.00 to 6.00 in the valley of the Rio Grande and on the coast of the South Atlantic States, Oregon, and Washington; it was least, viz: 0.00 in Nevada, southern Florida, and western Arizona.

The *diurnal variation* is shown by Table XII, which gives the total precipitation for each hour of seventy-fifth meridian time, as deduced from self-registering gauges kept at about 43 regular stations of the Weather Bureau; of these 37 are float gauges and 7 are weighing gauges.

The *normal precipitation* for each month is shown in the Atlas of Bulletin C, entitled "Rainfall and Snow of the United States, compiled to the end of 1891, with annual, seasonal, monthly, and other charts."

The *current departures* from the normal precipitation are given in Table I, which shows that there was an excess in northern California, Oregon, Alberta, and portions of adjacent States. Elsewhere there was a general deficiency, and especially in eastern Texas, the Gulf, and Atlantic States.

The large excesses were: Indianapolis, 4.6; Sault Ste Marie, 2.9; Nashville, 2.7; Baltimore, 2.2. Deficits: Corpus Christi, 5.5; Galveston, 5.2; Cape Henry, 4.8; Kittyhawk and Norfolk, 4.7; Pensacola, 4.2; Port Eads, 4.1.

The years of greatest and least precipitation for September are given in the REVIEW for September, 1894. The precipitation for the current month was the greatest on record at: Sault Ste. Marie, 7.40; Indianapolis, 7.46; Sacramento, 1.26; Eureka, 3.14. It was the least on record at: Albany, 1.80; Vineyard Haven, 1.15; Cape Henry, 0.00; Lynchburg, 0.56; Raleigh, 0.38; Charlotte, 0.33; Cincinnati, 0.49; Lexington, 0.33; Chattanooga, 1.00; Atlanta, 0.21; Vicksburg, 0.14; Dodge City, 0.06; Port Angeles, 0.35.

The average departure for each district is also given in Table I. By djviding these by the respective normals the following corresponding percentages are obtained (precipitation is in excess when the percentages of the normals exceed 100).

Above the normal: Abilene (southern Slope), 139; northern Plateau, 205; middle Pacific, 402.

Below the normal: New England, 51; Middle Atlantic, 36; South Atlantic, 54; Florida Peninsula, 92; east Gulf, 24; west Gulf, 28; Ohio Valley and Tennessee, 67; lower Lakes, 70; upper Lakes, 91; North Dakota, 53; upper Mississippi, 88; Missouri Valley, 74; northern Slope, 78; middle Slope, 36; middle Plateau, 67; north Pacific, 82; south Pacific, 23.

The *total accumulated monthly departures* from normal precipitation from January 1 to the end of the current month are given in the second column of the following table; the third column gives the ratio of the current accumulated precipitation to its normal value.

Districts.	Accumulated departures.	Accumulated precipitation.	Districts.	Accumulated departures.	Accumulated precipitation.
	Inches.	*Per ct.*		*Inches.*	*Per ct.*
Abilene (southern Slope)	+ 5.00	124	New England	− 5.30	84
Southern Plateau	+ 0.40	105	Middle Atlantic	− 7.50	79
			South Atlantic	− 2.70	94
			Florida Peninsula	− 3.30	92
			East Gulf	− 4.30	90
			West Gulf	− 5.40	84
			Ohio Valley and Tenn.	− 9.70	73
			Lower Lakes	− 7.10	72
			Upper Lakes	− 6.20	76
			North Dakota	− 0.70	96
			Upper Mississippi	− 6.50	77
			Missouri Valley	− 3.30	88
			Northern Slope	− 0.40	97
			Middle Slope	− 1.30	93
			Middle Plateau	− 1.10	87
			Northern Plateau	− 2.60	78
			North Pacific	− 1.80	95
			Middle Pacific	− 0.90	95
			South Pacific	− 2.40	80

Details as to excessive precipitation are given in Tables XIII and XIV.

The total snowfall at each station is given in Table II. Its geographical distribution is given on Chart No. VI of total

monthly snowfall. The isotherms of minimum 32° and 40° are also shown on this chart.

HAIL.

The following are the dates on which hail fell in the respective States:

Alabama, 5. Arizona, 16, 29. Arkansas, 5. California, 18. Colorado, 2 10, 14, 15, 21, 29. Idaho, 13, 18, 19, 20. Illinois, 3, 4. 6, 15, 16, 25. Indiana, 13. Iowa, 3, 5, 6, 15, 20, 21. Kansas, 4, 6, 8, 9, 22. Maine, 14. Maryland, 9, 10, 29, 30. Massachusetts, 11. Michigan, 28. Minnesota, 5, 6, 8, 10, 17, 28. Missouri, 3, 4, 6, 28. Montana, 6, 13, 19, 20. Nebraska, 5, 20, 21, 22. Nevada, 18, 20. New Hampshire, 11, 14. New York, 7, 12, 15, 20, 30. North Dakota, 2, 21, 24. Ohio, 7, 12, 29, 30. Oklahoma, 6. Oregon, 10, 13, 19, 20. Pennsylvania, 9, 10, 30. Rhode Island, 9. South Dakota, 2, 5. Tennessee, 4, 6, 13, 16. Utah, 14, 17. Vermont, 11. Virginia, 19. Washington, 4, 16, 19. West Virginia, 9, 19. Wisconsin, 10, 15, 22, 25, 28.

SLEET.

The following are the dates on which sleet fell in the respective States:

Colorado, 21, 22. Idaho, 20, 21. Kansas, 22. Michigan, 29, 30. Minnesota, 28, 29. Montana, 19, 20. Nebraska, 21. Nevada, 20. New York, 27, 30. Ohio, 30. Pennsylvania, 30. Utah, 21.

WIND.

The *prevailing winds* for September, 1895, viz, those that were recorded most frequently, are shown in Table I for the regular Weather Bureau stations.

The *resultant winds*, as deduced from the personal observations made at 8 a. m. and 8 p. m., are given in Table IX. These latter resultants are also shown graphically on Chart II, where the small figure attached to each arrow shows the number of hours that this resultant prevailed, on the assumption that each of the morning and evening observations represents one hour's duration of a uniform wind of average velocity. These figures indicate the relative extent to which winds from different directions counterbalanced each other.

HIGH WINDS.

Maximum wind velocities of 50 miles or more per hour were reported at regular stations of the Weather Bureau as follows (maximum velocities are averages for five minutes; extreme velocities are gusts of shorter duration, and are not given in this table):

Stations.	Date.	Velocity.	Direction.	Stations.	Date.	Velocity.	Direction.
		Miles				*Miles*	
Amarillo, Tex	21	52	s.	Oklahoma, Okla	6	52	n.
Do	28	50	n.	Pierre, S. Dak	19	52	w.
Chicago, Ill	4	53	s.	St. Paul, Minn	6	55	se.
Do	22	50	s.	Tatoosh Island, Wash	19	58	nw.
Huron, S. Dak	5	61	se.	Williston, N. Dak	24	52	w.
Marquette, Mich	5	52	se.	Winnemucca, Nev	11	50	sw.

SUNSHINE AND CLOUDINESS.

The quantity of sunshine, and therefore of heat, received by the atmosphere as a whole is very nearly constant from year to year, but the proportion received by the surface of the earth depends largely upon the absorption by the atmosphere, and varies with the distribution of cloudiness. The sunshine is now recorded automatically at 15 regular stations of the Weather Bureau by its photographic, and at 22 by its thermal effects. At one station records are kept by both methods. The photographic record sheets show the apparent solar time, but the thermometric sheets show seventy-fifth meridian time. For convenience the results are all given in Table XI for each hour of mean local time. The cloudiness is determined by numerous personal observations at all stations during the daytime, and is given in the column of "average cloudiness" in Table I; its complement or clear sky is given in the last column of Table XI.

COMPARISON OF SUNSHINE AND CLEAR SKY.

The sunshine registers give the *duration* of direct sunshine whence the percentage of possible sunshine is derived; the observer's personal estimates give the percentage of *area* of clear sky. These numbers have been brought together, side by side, in the following table, from which it appears that, in general, the instrumental record of percentage of duration of sunshine is almost always larger than the observers' personal estimate of percentage of area of clear sky; the average excess for September, 1895, is 8 per cent for photographic records, and 11 per cent for thermometric records. The details are shown in the following table:

Difference between instrumental and personal observations of sunshine.

Photographic stations.	Instrumental.	Personal.	Difference.	Thermometric stations.	Instrumental.	Personal.	Difference.
Denver, Colo	89	74	15	Vicksburg, Miss	90	84	14
Phœnix, Ariz	89	77	12	Chicago, Ill	86	71	15
Santa Fe, N. Mex	86	75	11	Cincinnati, Ohio	86	67	19
Dodge City, Kans	84	77	7	Des Moines, Iowa	84	67	17
Kansas City, Mo	78	73	5	New Orleans, La	83	83	0
San Diego, Cal	77	72	5	St. Louis, Mo	82	66	16
Washington, D. C	77	72	5	Philadelphia, Pa	81	58	23
Galveston, Tex	76	67	9	Little Rock, Ark	80	61	19
Salt Lake City, Utah*	75	57	18	Baltimore, Md	78	73	5
Savannah, Ga	75	67	8	Louisville, Ky	77	63	14
Bismarck, N. Dak	63	58	5	Wilmington, N. C	74	75	— 1
Cleveland, Ohio	59	50	9	Detroit, Mich	73	61	12
Eastport, Me	59	49	10	Atlanta, Ga	72	74	— 2
Helena, Mont	57	58	— 1	New York, N. Y	72	66	6
Portland, Oreg. †	48	44	4	Portland, Me	69	55	14
				Boston, Mass	68	57	11
				Rochester, N. Y	67	58	9
				San Francisco, Cal	63	60	3
				Columbus, Ohio	61	48	13
				Buffalo, N. Y	59	46	13
				Marquette, Mich	59	41	18
				Portland, Oreg. †	44	44	0

* No thermometric report. † Records kept by both methods.

ATMOSPHERIC ELECTRICITY.

Numerical statistics relative to auroras and thunderstorms are given in Table X, which shows the number of stations from which meteorological reports were received, and the number of such stations reporting thunderstorms (T) and auroras (A) in each State and on each day of the month, respectively.

The dates on which reports of thunderstorms for the whole country were most numerous were: 12th, 143; 15th, 127; 26th, 177.

Thunderstorm reports were most numerous in: Florida, 156; Illinois, 143; Massachusetts, 126; Minnesota, 136; Ohio, 173.

Thunderstorms were most frequent in: Florida, 25 days; Louisiana, Michigan, and Minnesota, 22; Illinois, 20.

Auroras.—The evenings on which bright moonlight must have interfered with observations of faint auroras are assumed to be the four preceding and following the date of full moon, viz, from the 1st to the 7th, inclusive, and also the 29th and 30th. On the remaining twenty-one days of this month 200 reports were received, or an average of about ten per day. The dates on which the reported number especially exceeded this average were: 14th, 31; 15th, 34; 16th, 44; 17th, 43; and 29th, 28.

Auroras were reported by a large percentage of observers

in: North Dakota, 34 per cent; Maine and Minnesota, 72; Montana, 53; Wisconsin, 39.

Auroras were reported most frequently in: Minnesota, on 14 days; North Dakota and Wisconsin, 11; Montana, 8; New York and South Dakota, 7.

CANADIAN DATA—THUNDERSTORMS AND AURORAS.

Auroras were reported as follows: 2d, Quebec. 4th, Qu'Appelle. 14th, Halifax, Quebec, Montreal, Winnipeg, Minnedosa, Qu'Appelle, Calgary, and Prince Albert. 15th, Grindstone, White River, Minnedosa, Qu'Appelle, and Prince Albert. 16th, Montreal, Port Arthur, and Winnipeg. 17th, Quebec, Port Arthur, Winnipeg, and Minnedosa. 18th, Quebec, Winnipeg, Minnedosa, Qu'Appelle, Swift Current, and Prince Albert. 19th, Charlottetown and Port Arthur. 20th, White River. 23d and 24th, Minnedosa. 29th, Toronto, Minnedosa, and Prince Albert. 30th, Port Arthur, Winnipeg, and Prince Albert.

Thunderstorms were reported as follows: 2d, Winnipeg, Minnedosa, and Qu'Appelle. 4th, Rockliffe, White River, Port Stanley, and Port Arthur. 6th, Calgary. 7th, Rockliffe and Toronto. 9th, Port Stanley. 10th, White River and Parry Sound. 11th, Montreal, Rockliffe, and Parry Sound. 12th, Toronto and Port Stanley. 15th, Port Arthur. 16th, Port Stanley. 17th, Winnipeg and Qu'Appelle. 18th, Toronto, Saugeen, and Parry Sound. 19th, Port Stanley and Esquimalt. 20th, Rockliffe, White River, and Minnedosa. 21st, Yarmouth. 22d, Father Point. 23d, Father Point and White River. 25th, Toronto. 26th, Grand Manan, St. Andrews, Port Stanley, and Saugeen. 27th, Charlottetown and Battleford. 28th and 30th, Battleford.

INLAND NAVIGATION.

The *extreme and average stages of water* in the rivers during the current month are given in Table VII, from which it will be seen that no river has attained the danger line; the nearest approaches were the high water in the Arkansas River on the 13th and 15th. The unusual stage of low water that has continued to prevail during September in the upper Mississippi, the Missouri, and Ohio rivers and their tributaries, is shown by the figures given in the column showing the lowest stage of water. As a rule, the zeros of the Weather Bureau gauges are put at, or slightly below, the lowest water on record, and in several cases it will be noticed that the rivers have, during the month, receded to, or below, this lowest previous record.

METEOROLOGY AND MAGNETISM.

By Prof FRANK H. BIGELOW.

For general remarks relative to this subject see page 7 of the REVIEW for January, 1895.

The comparison of the air temperature with magnetic horizontal force is shown in detail on Chart V, and the special features of the September curves are as follows:

SPECIAL FEATURES FOR SEPTEMBER.

The correction for slope is + 1° for each group of temperature stations; the reduction to a normal base line is — 8°. The reduction of the horizontal force variations to a mean base line is + 12. The temperature and pressure data are each set back one day to allow for the eastward drift.

STATE WEATHER SERVICES.

By JAMES BERRY, Chief of State Weather Service Division.

The following extracts in regard to the general weather conditions in the several States and Territories are taken from the monthly reports of the State Weather Services.

Snowfall and rainfall are expressed in inches.

Alabama.—The average temperature for the northern section was 76.8°; southern section, 79.4°; and State, 78.1°. The maximum, 101°, occurred at Goodwater on the 23d, and the minimum, 34°, at Valley Head on the 30th. Frost occurred in central and northern portions on the 29th and 30th. Nearly all the rain occurred in the first week. Total average amount was 1.48, or 1.26 below normal.

Arizona.—The mean temperature, 77.1°, or about 3.5° above normal. The highest reported, 115°, occurred at Maricopa, and the lowest, 26°, at Whipple Barracks. The average total precipitation was 1.22, or only 0.02 less than normal. The greatest amount, 3.00, was reported from Mount Huachuca, while several stations reported "no rain."

Arkansas.—The weather was unfavorable for all agricultural pursuits except saving hay and fodder. The mean temperature was 77.1°, or 4.6° above the average, and the highest on record. The maximum, 105°, which occurred at Helena on the 13th, exceeded the previous record, and the minimum, 32°, at Corning on the 30th, equaled it. The period from the 9th to 22d, inclusive, was the warmest experienced for the past seventeen years, the average excess being 10°. The last three days were cooler than the normal by 10°. Frosts occurred on the 24th, 27th, 28th, 29th, and 30th, at one or more stations. The average total precipitation was 1.38, or 1.74 less than normal. Precipitation was local in character and badly distributed. The greatest amount, 3.88, was reported at Camden, and the least, 0.03, at Searcy. A brilliant meteor was observed at 9 p. m., on 25th at Bee Branch, Kirby, Little Rock, Lonoke and Rison. Hail was reported at Corning on 5th.

California.—The average temperature was 65.1°, or 4.7° less than normal; highest, 115°, reported from Volcano Springs, and the lowest, 6°, at Bodie. Average precipitation, 1.44, or 1.23 in excess of normal. The greatest amount, 9.57, was reported from Upper Mattole, and the least, 0.00, at a few stations in the southern portion. Frosts were reported on the 3d, 4th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22d, 23d, and 24th.

Colorado.—The mean temperature was 61°, or 3° above the normal. The highest temperature, 105°, was reported from Julesburg on the 17th, and the lowest, 0°, at Gulch on the 21st. Freezing temperatures prevailed generally on the 22d and 23d. The mean precipitation was 0.55, or 0.35 below the average. The first twenty days the fall was light. On the 21st a heavy snowstorm occurred generally over the eastern Slope, 11.4 being recorded at Denver, which is the largest in September during a period of 25 years.

Connecticut.—(See *New England.*)

Delaware.—(See *Maryland.*)

District of Columbia.—(See *Maryland.*)

Florida.—From the 1st to 15th, inclusive, showers were well distributed but in some cases excessive, particularly over portions of the western and southern districts. Many stations, however, during this period complained of lack of moisture. From the 15th, and including the last decade, there was less rain. During the last week there was little except a few badly distributed showers, and reports show that much damage was sustained, especially among early gardens. The mean temperature was 79.5°, or 0.2° above the average. The highest temperature, 96°, was reported at Kissimmee on the 1st and 2d, and the lowest, 57°, at Pensacola and Tallahassee on the 30th. The average amount of precipitation was 4.77, or 2.27 less than normal. The greatest fall, 9.13, occurred at Hypoluxo, and the least, 1.14, at Lake City.

Georgia.—The month was as noticeable for its dryness as the preceding one for its excessive moisture. The total rainfall in some sections did not exceed half an inch. The average amount for the State was 1.53, or 2.61 less than the normal. It was excessively hot until near the close of the month, when a cool wave spread over the State, lowering the temperature very decidedly but not sufficiently to cause frost except in a few exposed places in the extreme northern counties.

Idaho.—The mean temperature was 53.3°. The highest temperature, 96°, was recorded at Idaho City on the 29th, and the lowest, 8°, at Chesterfield on the 22d. Severe frosts accompanied by freezing temperatures occurred on the 6th over the southern section. Frosts were frequent during the latter part of the month. That of the 22d was exceptionally severe, and effectually stopped growth of vegetation over the greater portion of the State. The average precipitation was 1.44. The greatest amount, 4.31, was recorded at Murray, and the least, 0.20, at Lake.

Illinois.—The mean temperature was 70.7°, or 5.3° above the normal. The highest temperature, 102°, was recorded at Holts on the 17th, and the lowest, 24°, at Oswego on the 30th. It is probable that the last day of the month gave the lowest temperature ever recorded in September within the State. Frost was quite general over the central and northern counties on the 24th, and again on the 27th, 29th, and 30th. On the latter date thin ice formed in most north-central and northern

counties. Little grain which could be injured remained standing. The precipitation was about a quarter of an inch below the normal. It occurred principally in hard showers from the 3d to 7th. The largest amount, 6.50, was recorded at Bushnell, and the least, 0.59, at Oswego.

Indiana.—Warm weather continued until near the end of the month, when the temperature fell quite suddenly, at some stations to below freezing, on the last day. The mean temperature was 70.6°, or 5° above the normal. The highest temperatures on record for September were noted at some stations this year, and the minimum temperatures equaled the previous record at some stations. The average precipitation was 2.23, or 0.84 below the normal. The largest amount, 7.46, was recorded at Indianapolis, and the least, 0.50, at Vevay. At Indianapolis 6.07 fell in less than five hours, being the greatest amount recorded since the establishment of the station. Much damage was done by the overflowing of streets and cellars. This heavy rain was local, little or none falling outside of Marion County. Frost on the 2d, 24th, 27th, 28th, 29th, and 30th.

Indian Territory.—(See *Oklahoma.*)

Iowa.—The mean temperature was 6.68°, or 4.8° above the normal. The month was noted for high temperatures, especially during the second decade, the daily excess at the central station from the 10th to 21st being 15°; during that period the minimum temperature was as low as the normal on but two days. The month closed with a cold wave, which gave killing frosts over the larger portion of the State, and temperatures below freezing throughout the northern half. The highest temperature, 1.03°, was recorded at Gleenwood and Iowa Falls on the 17th; the lowest, 22°, at Atlantic on the 30th. The average rainfall was 3.03, or 0.67 below the normal. The greatest amount, 7.43, was reported at Alta, and the least, 0.85, at Jefferson.

Kansas.—The first eight days were cool and pleasant, with light showers over the State and good rains in the extreme eastern counties, culminating on the 8th and night of the 8–9th in a severe storm. It was succeeded by hot, dry weather until the 22d, when a cold wave, with rain, swept across the State, with snow in the northwestern counties, followed by a general frost on the 23d, which was severe over the western half of the State. The period 9th to 22d was probably the hottest for that length of time in September ever experienced in the State. The mean temperature, 72.7°, or 4° above the normal. The highest temperature, 110°, was recorded at Phillipsburg on the 13th, and the lowest, 22°, at Garden City on the 29th. The average rainfall was 1.71, or 0.51 below the normal. The greatest amount, 10.12, was recorded at Columbus, and the least, 0.00, at the New England Ranch and Coolidge. Snow occurred on the 21st and 22d, and frost on the 7th, 22d, 23d, 24th, 26th, 27th, 28th, 29th, and 30th.

Kentucky.—The weather presented some very remarkable features. The extremes of temperature were unusual; the daily maxima exceeded 95°, and occurred in nearly all sections during the second decade. The excessive heat continued from the 8th to 23d. Cooler weather prevailed, reaching the frost line during the closing days of the month. The mean temperature, 73.4°, was 4° above the normal. Drought conditions prevailed practically throughout the month. The average precipitation, 1.10, was 1.70 below the normal. Water was so scarce in the springs and creeks that, in some instances, stock had to be driven many miles to obtain it. The rainfall was very unevenly distributed, and came almost wholly in local showers. The greatest amount, 3.18, was recorded at Mount Sterling, and the least, 0.00, at Princeton. Frost was reported from nearly every station on the 30th, and from a few places on the 29th.

Louisiana.—This was generally a dry, hot month, favorable for harvesting rice, corn, and hay, and for picking cotton, but as a rule unfavorable in its effect on the growing crops. The mean temperature, 80°, was nearly 4° above the normal. The highest temperature, 102°, was recorded at Liberty Hill on the 15th, and the lowest, 37°, at Davis on the 30th. The rainfall varied widely in quantity, being heaviest generally over the more southern parishes and the extreme southeastern portion. The greatest amount, 6.31, was recorded at Lawrence, and the least, 0.09, at Delhi. The average amount was 1.89. Very light frost recorded at Davis on 30th.

Maine.—(See *New England.*)

Maryland.—The mean temperature was 70.6°, 3.7° above the normal. The highest temperature, 101°, was recorded at College Park on the 23d, and the lowest, 27°, at Deer Park on the 28th. The average precipitation, 2.04, was 1.77 below the normal. The greatest amount, 5.90, occurred at Baltimore, and the least, 0.15, at Cumberland. Frost on the 10th and 30th.

Massachusetts.—(See *New England.*)

Michigan.—The mean temperature, 34.2°, or 3.4° above the normal. The highest temperature, 100°, was recorded at Adrian on the 11th, and the lowest, 29°, at Boon on the 24th. The average total precipitation was 2.82, or slightly below the normal. Over the upper peninsula some unusually heavy monthly totals were reported, the greatest, 10.36, at Calumet. The greatest deficiencies occurred over the central southern portion. The least amount, 0.15, was recorded at Berrien Springs. Snow on 28th and 29th. Frost on 1st, 14th, 24th, 25th, 27th, 28th, 29th, and 30th.

Minnesota.—The severe hot spell from the 17th to 20th, inclusive, broke all previous records for heat so late in the season. The average temperature was 61.5. The highest temperature was 108° at Dawson on the 8th, and the lowest, 17°, at Ada on the 30th. The average total precipitation was 3.93. The total amounts ranged from 0.15 at Fergus Falls to 8.63 at Two Harbors. Killing frost on 23d, 27th, 29th, and 30th.

Mississippi.—A protracted hot spell lasted from the 1st to the 27th; during this time temperatures at Vicksburg were continuously above normal, a condition that doubtless prevailed in all portions of the State. A cool wave occurred at the close of the month and gave a lower temperature at Vicksburg on the 30th than had ever been recorded during September; light frost occurred on that date in spots as far south as Adams County. The mean temperature was 70°, or nearly 5° above normal. The highest temperature recorded was 105°, at Vaiden on the 15th, and the lowest, 33°, at French Camp on the 30th. Light frost occurred on the 29th and 30th, but, owing to the prevailing dryness, very little damage resulted. The average precipitation was 1.02, being 2.79 less than normal. The greatest amount recorded was 3.30, at Water Valley, and the least, 0.00, at Kosciusko.

Missouri.—The month was the warmest for many years; the mean temperature was 71.8°, or 4° above the normal. The highest temperature recorded was 104° at Willow Springs on the 12th. The frosts which occurred at the close of the month did but little damage. The average precipitation was 2.34, or 0.98 less than normal. The greatest total fall, 8.80, was recorded at Oto. A heavy hailstorm passed over the northeast section on the 3d and did considerable damage. Hailstones measuring 3 inches in diameter fell at New London in Ralls County. Frosts occurred on the 22d, 23d, 24th, 26th, 27th, 28th, 29th, and 30th, and hail on the 3d and 4th.

Montana.—The mean temperature was 53°, or about 3° below the normal. The highest temperature, 106°, was recorded at Wibaux on the 1st, and the lowest, 10°, at Grantsville on the 7th. Cold weather was general on the 21st and 22d. The average precipitation was 1.15, or about 0.15 above the normal. The greatest amount, 4.50, was recorded at Cokedale, and the least, 0.02, at Great Falls. Snow fell in the southern portion on the 20th and 21st, 35 inches being reported at Cokedale, near which place a man named Cheney was lost in the snow and frozen to death on the 20th.

Nebraska.—During the first twenty days the temperature was almost continuously above the normal. The mean temperature was 68°, or 4.6° above. The highest recorded was 110° at Grand Island, and the lowest, 20°, at numerous stations on the last three days. During the last ten days it was almost continuously below the normal, with killing frosts. The average precipitation was 1.39, or 0.45 below the normal. The greatest amount, 4.85, occurred at Lyons, and the least "trace" at Benkleman. Frosts occurred on the 21st, 22d, 23d, 27th, 28th, 29th, and 30th.

Nevada.—The mean temperature was 59.9°, or nearly 2° below the normal. The highest temperature recorded was 106°, at St. Thomas, on the 8th, and the lowest, 0°, at Carlin, on the 22d. The mean precipitation was 0.21, a deficiency of 0.29. This deficiency was general all over the State, but more particularly in the northern and southern portions. The only excesses occurred in the northeastern and southwestern corners. Snow fell to an average depth of a third of an inch, but was principally reported from stations having altitudes of over 6,000 feet. The greatest amount, 4.00, fell at Osceola. Frosts occurred on the 14th, 18th, 19th, 20th, 21st, 22d, 23d, and 24th.

New England.—The warmest spell during the month, and at many places the warmest for the season, occurred from the 21st to 23d. A number of observers reported it the warmest ever recorded in September. The mean temperature was 62.8°, or 1° to 4° warmer than usual. The highest temperature was 100° at Farmington on the 22d, and the lowest, 24°, at Grafton, on the 15th. The coldest spell was from the 14th to 16th, when the minimum temperatures at most stations were experienced. Frost was reported in most northern, and in the valleys, in the southern districts. The average precipitation was 2.45, or 0.83 less than normal. The greatest amount was 5.53 at Monson, and the least, 1.05, at Orono. The precipitation was everywhere light, and a great many water supplies ran dry; in northern districts, especially, rivers are lower than known for years, if ever. In eastern Maine several electric power stations were obliged to shut down because of lack of water in the rivers. Frost was reported on the 2d, 14th, 15th, and 29th.

New Hampshire.—(See *New England.*)

New Jersey.—The mean temperature was 69.7°, or 5.2° above the normal. The highest temperature recorded was 109° at Somerville on the 21st, and the lowest, 29°, at Franklin Furnace, on the 15th. The average precipitation was 1.07, or 2.82 below the normal. The largest amount recorded was 2.71 at Toms River, and the least, 0.22, at Rancocas. Frost occurred on the 15th, 16th, 28th, 29th, and 30th.

New Mexico.—The temperature averaged above the normal. The weather was generally clear, warm, and pleasant until the 21st, when a sharp cold wave moved down from the northwest, causing frosts in the northern half; this was followed by colder weather with considerable cloudiness and some rain, during the last week. The highest temperature reported was 101° at Roswell on the 4th, and the lowest, 16°, at Monero on the 22d. The precipitation averaged considerably below the usual amount and was very unevenly distributed. The greatest total amount was 4.20 at Down's Ranch, and the least, 0.00 at Raton and Albert.

New York.—The mean temperature was 65°, or about 2.7° above the normal. The highest temperature was 99° at Poughkeepsie on the 23d and West Point on the 24th; the lowest, 22°, at Bloomville on the 15th. The average precipitation was 2.31, or about 1.07 below the normal amount. The largest rainfall was 6.42, and was recorded at Number Four, and the smallest, 0.72 at Warwick.

North Carolina.—The month was the most abnormal on record. The characteristic features were the unprecedented hot wave during the second and third decades, and the severe drought during the same period. The mean temperature was 74.2°, or 4° above the normal. The highest temperature was 104° at Tarboro on the 22d and 23d; the lowest, 32°, at Blowing Rock and Highlands on the 30th. The average rainfall was 1.25, the lowest on record for September, and 3.40 less than the usual amount. Frost occurred on the 28th, 29th, and 30th.

North Dakota.—The mean temperature, 56.6°, was also the normal. The highest temperature, 100°, occurred at Fort Berthold and Washburn on the 2d; the lowest, 12°, at Forman on the 30th. The rainfall was moderately heavy in the eastern and southeastern sections and very light and poorly distributed in other portions; the average amount was considerably less than normal. Frosts were recorded on the 6th, 7th, 17th, 22d, 23d, 26th, 27th, 28th, 29th, and 30th.

Ohio.—The mean temperature was 69°, or 5.1° above normal. The highest temperature was 105° at Hillsboro on the 20th, and the lowest, 25°, at New Waterford on the 15th and 28th. It was excessively hot from the 9th to the 12th and the 17th to the 22d; the latter period was the most oppressive and severe. The warmth was very unusual for September, and previous records were broken. The month closed with freezing temperatures in many localities. Much less than the usual amount of precipitation fell. The average amount was 1.66, or 1.49 below the normal. The heaviest rainfall occurred in the northeastern, and the lightest in the western, counties. Frosts occurred on the 1st, 2d, 3d, 4th, 14th, 15th, 23d, 24th, 25th, 27th, 28th, 29th, and 30th. Traces of snow occurred at isolated places on the 29th and 30th.

Oklahoma.—The mean temperature was 77.3°, or 5.7° above the normal. The highest temperature was 108° at Anadarko on the 4th; the lowest, 30°, at Clifton on the 30th. The average precipitation was 1.10, or 1.79 less than normal. The greatest amount, 6.00, was recorded at Vinta, and the least, 0.00, at Sac and Fox Agency.

Oregon.—The mean temperature was 55.4°, being 3.0° below the normal. This was one of the coldest Septembers Oregon has experienced. The cold weather was not confined to any particular section of the State. The average total precipitation was 2.90, or 0.92 less than the usual amount. The greatest amount, 10.28, was recorded at Bandon, and the least, 0.19, at New Bridge. Frosts occurred on the 5th, 6th, 7th, 8th, 9th, 10th, 14th, 15th, 17th, 18th, 19th, 20th, 21st, 22d, 23d, and 27th.

Pennsylvania.—The mean temperature was 57.8°, or 5.1° above the average. The highest temperature was 100°, recorded on the 21st and 22d at Carlisle, Coatesville, and Hamburg; the lowest, 24°, at Shinglehouse on the 15th. The average precipitation was 1.71, or 2.38 less than the usual amount. Injurious drought prevailed throughout the month. Streams and springs were unusually low. The largest total amount was 5.41, at Saegerstown, and the smallest, 0.37, at Reading. Snow occurred on the 29th and 30th, and frost on the 2d, 14th, 15th, 25th, 28th, 29th, and 30th.

Rhode Island.—(See *New England.*)

South Carolina.—The mean temperature was 76.9°, or 2.8° above normal. It was the warmest September in the interior of which there is any record. The highest was 106°, at Spartanburg, on the 25th; the lowest, 35°, at Holland, on the 30th. The average precipitation, 1.29, or 3.65 less than the normal. The largest amount recorded was 6.94, at Charleston, and the smallest, 0.00, at Central, Longshore, and Shaws Forks. The only territory having an excess of rainfall was a narrow strip extending from Beaufort to Charleston. Frost was recorded at Oconee, on the 30th.

South Dakota.—Unusually high temperatures prevailed at times during the first and second decades, with scattered showers, mostly light, and followed by cooler weather in the third decade, with quite general heavy rains. The mean temperature was 63.2°, or about 4.3° above normal. The maximum temperature was 112°, at Forestburg, on the 17th, and the minimum, 12°, at Watertown, on the 30th. The average precipitation was 1.65, or 0.21 in excess of the normal amount. The greatest total amount, 4.40, was recorded at Tyndall, and the least, 0.15, at Farmingdale. Frost occurred on the 4th, 5th, 6th, 7th, 8th, 14th, 15th, 21st, 22d, 23d, 24th, 27th, 28th, 29th, and 30th.

Tennessee.—The high temperatures and small amount of rain which prevailed almost during the entire month caused a severe drought. The mean temperature was 74.2°, or 6.5° above the average, and is the highest September average for the past thirteen years. The highest temperature was 100°, recorded at Covington on the 16th; the lowest, 27° at Bristol, on the 30th. The average rainfall was 2.12, or 1.40 less than the usual amount. Most of the rain fell during the first seventeen days, after which date little or none was reported. The greatest amount was 7.48, at Lynnville, and the least, 0.05, at Bristol. Frost was recorded on the 28th, 29th, and 30th.

Texas.—The mean temperature was 2.8° above the normal; the highest daily being 106° at Roby on the 5th, and the lowest, 30°, at Happy on the 23d. The rainfall was very unevenly distributed. There was comparatively none during the first and second decades, but some good local rains occurred during the third which, to some extent, reduced the deficiency. The average total amount was 1.72 less than usual. The largest amount, 6.79, was recorded at Fort Stockton, and there was no rain at four stations. Frosts occurred on the 21st, 22d, 23d, and 24th.

Utah.—The mean temperature was 60.8°; the maximum daily, 103°, at St. George on the 8th, and the minimum, 9°, at Fillmore on the 22d. The average precipitation was 0.60; the greatest recorded was 2.26 at Millville, and the least, "trace," at Orton. The precipitation was principally in the form of snow, which fell on the 20th and 21st. Frosts were recorded on the 5th, 7th, 20th, 21st, 22d, 23d, 24th, 25th, 26th, 27th, 28th, 29th, and 30th.

Virginia.—The mean temperature was 72.7°; the highest daily, 107°, occurred at Bon Air on the 19th; the lowest, 25°, was reported at Big Stone Gap on the 30th. The average precipitation was 0.76, considerably less than the usual amount; the greatest, 2.24, was recorded at Callaville, and the least, 0.00, at Cape Henry. Frost on the 2d, 28th, 29th, and 30th.

Vermont.—(See *New England.*)

Washington.—The principal characteristics of the weather were unusual dryness in the western section; rainfall double the average in the eastern section, and a temperature decidedly below the normal in both. It was the coldest September for several years. The mean temperature was 53.9°, or 3.4 below the normal. The maximum temperature was 96° at Fort Spokane on the 1st, and the minimum, 22°, at Hunters on the 21st. The average precipitation was 2.07, or 0.11 below normal. The greatest amount, 11.45, occurred at Monte Cristo, and the least, 0.51, at Hoxie.

West Virginia.—The mean temperature was 70.3°, or about 4° above the normal. The highest temperature recorded was 107°, at Nuttallburg, on the 20th, and the lowest, 20°, at the same station on the 30th. The rainfall was greatly below the normal, and drought prevailed in all sections. The average amount was 1.70. Frost occurred on the 28th, 29th, and 30th.

Wisconsin.—The mean temperature was 64.7°, or 4° above the average. The highest temperature recorded was 100°, at Prairie du Chien on the 11th, and the lowest, 23°, at Barron and at Belleville on the 23d and 30th, respectively. Continued high midday temperatures and moderately cool nights prevailed until the 22d, when it became much cooler. The average rainfall was 2.99, or 0.10 above the normal. The greatest amount recorded was 10.21 at Butternut, and the least, 0.67, at Janesville. The rainfall was very poorly distributed, and occurred in the form of heavy local thunderstorms, which only slightly relieved the droughty conditions generally prevailing. Frost occurred on the 24th, 26th, 27th, 28th, 29th, and 30th.

Wyoming.—The mean temperature, 53°, was very near the normal. The highest temperature recorded was 101°, at Fort Laramie on the 14th, and the lowest, 0°, at Fort Yellowstone on the 22d. It is probable that such extremes were never known during any previous September. The average total amount of precipitation was 0.83, or about normal. The greatest amount recorded was 2.20, at Lander, and the least, 0.16, at Fort Laramie. The average depth of snowfall was 7.50 during the storm of the 20th to 22d.

STUDIES BY FORECAST OFFICIALS.

COLD WAVES ON THE MIDDLE GULF COAST.

By Prof. E. B. GARRIOTT (dated December 16, 1895).

Practically, all of the important cold waves of the United States first appear over British America and advance thence over districts in the United States which are covered by the sweep of northerly winds in the west quadrants of areas of low barometric pressure. The cold waves of the middle coast of the Gulf of Mexico follow in the wake of areas of low pressure which reach the lower Mississippi Valley.

As cold waves are a product of the cyclonic circulation of winds about areas of low pressure, a consideration of the habits and characteristics of the low areas of the colder months, and more especially of those which have been attended by cold waves, is necessary to a determination of the

several types of cold waves and of the conditions which contribute to their development and movement.

A well-defined low area presents a warm and a cold side. In the east or warm side southerly winds are attended by the higher temperature of lower latitudes; in the west, or cold side of the low area west to north winds carry southward the cold of higher latitudes. At any given point in the east quadrants of the low area warm, southerly winds will prevail. As the center of disturbance passes to the eastward the cold, northerly winds of the west quadrants are experienced. When, therefore, abnormally high temperature obtains in the front, and abnormally low temperature in the rear, of a low area, a decided fall in temperature will be experienced within the area of active cyclonic disturbance following the passage to the eastward of the storm center, and in cases where a decided and specified fall to the freezing or frost temperature occurs, a cold wave is noted.

The cold waves of the middle Gulf Coast belong to two fairly well-defined types. They either follow the passage of a low area from the northwestern States to the lower Mississippi Valley, or follow a low area which develops or appears in the extreme southwest. The southwest low area may develop in the southern part of a trough of low pressure which extends southward between the Rocky Mountains and Mississippi River, or it may appear near the west Gulf Coast and move thence over the middle Gulf States. A necessary condition to the southward sweep of the cold waves, whether they depend upon the northwest or the southwest low areas, is an unbroken area of high barometer extending over the Rocky Mountain and Plateau regions. It is also necessary to the verification of a cold-wave signal on the middle Gulf Coast, in cases where a fall of 16° to 42° is required, that a 24-hour fall in temperature of 20°, or more, shall have occurred in the middle-western States, and that a gradient of at least 25° shall appear between the Gulf Coast and the thirty-fifth parallel. When, therefore, the weather maps show a well-defined low area over the lower Mississippi Valley, with temperature 60°, or below, at New Orleans, and an area of high pressure of great magnitude covering the Rocky Mountain and Plateau regions, with a 24-hour fall in temperature of 20°, or more, in States lying between the lower Missouri River and the middle Rocky Mountains, and a temperature gradient of 25°, or more, between New Orleans and Oklahoma, a fall in temperature of at least 16° may be expected along the middle Gulf Coast within twenty-four hours.

SPECIAL CONTRIBUTIONS.

METEOROLOGY AND MAGNETISM.

By Prof. FRANK H. BIGELOW (dated December 15, 1895).

General remarks on the observations for the year, October 1, 1894, *to September* 30, 1895.

The leading facts regarding the existence at the earth of two systems of deflecting magnetic forces, depending upon solar action as their cause, are now so far developed as to show that there is an intimate connection between them and certain meteorological phenomena. It is evident that the further development of the subject should proceed along two lines, leading (1), to the elucidation of the physical laws involved, and (2), to a practical application to current meteorological conditions, particularly the art of forecasting. Unfortunately neither of these are easy to prosecute satisfactorily, in consequence of the very complex nature of the interrelated phenomena prevailing in the earth's atmosphere, and the obscurity of our information regarding the nature of the ether and the transference of its energy to ponderable matter. Only a slow growth in such knowledge can be looked for, though eventually much may be accomplished, and since close attention is being paid to these topics by physicists, a steady advance will doubtless take place.

For the year October 1, 1894–September 30, 1895, inclusive, certain data regarding the horizontal magnetic force, the pressures and temperatures have been published in the MONTHLY WEATHER REVIEW. The primary object of this publication has been, not so much to establish a connection between meteorology and magnetism, as to exhibit the condition of the practical problem in the simplest possible form, and to gather data from which to judge regarding the proper system of operations to be pursued in connection with forecasting. It is not possible to approach the problem directly, because no magnetic and meteorological observations have ever been taken simultaneously at the seat of the principal transference of energy on the American continent, namely, just east of the Rocky Mountain range in the British Possessions, where the belt of maximum auroral frequency crosses that district; that is to say, at about 115° west longitude and 55° north latitude. A limited knowledge of the operations of the polar magnetic field that emanates from the sun, shows that, as it enters the earth, it is subject to great local variations in direction and in strength at different stations. This differentiation of a field, which is uniform just outside the earth's atmosphere, into local fields of varying vectors will, no doubt, in time, become one of the best means of studying the meteorological conditions of the upper atmosphere, considered as an absorber and transformer of ether energy, but at present it complicates the question under immediate consideration.

The successful establishment and maintenance of first class magnetic observatories requires money and skill, and this need, unfortunately, limits their number to such an extent as to prevent adding one to each of the principal stations of the Weather Bureau. Possibly, however, a few stations can be fully equipped with magnetic instruments, and others may supplement these by using secondary apparatus for relative variations, entirely apart from absolute measurements. During the past two years some attention has been devoted to a consideration of the best form of secondary apparatus for the purpose of recording the relative changes in the impressed solar field from day to day. The features most desired are moderate expense for the instrument, and ease of observation, so that it can be as readily handled as a barometer or thermometer by the observers of the Bureau. My efforts have taken two directions: (1), the construction of a time-integrator by means of a rapidly vibrating magnet; (2), the use of the ordinary bifilar indications unreduced for temperature and instrumental errors. Regarding the former a report may be expected after further observations are secured. Concerning the latter, the data for the present remarks have been presented in this REVIEW.

It is known that the field with which the frequent changes in the meteorological elements of the Northwest are apparently associated, enters the atmosphere of the earth in directions nearly parallel to the magnetic meridians, more definitely in lines normal to the ovals of the distribution of auroral frequency. We may properly call them *auroral meridians*. The concentration of energy in ovals surrounding the magnetic and the geographical poles must be due to such a distribution of the permeable material of the earth as shall make an exflected field in the arctic zone, and an inflected field

in the tropics. The southern field is so far absorbed in the heat of the tropical zones as to have no known definite effect upon the weather from day to day; the arctic field, on the contrary, has a persistent though loose tendency to excite the atmospheric circulation to form highs and lows in a peculiar sequence. Hence, it is the variations in the horizontal and vertical components of terrestrial magnetism from day to day that best measure the solar energy involved in the production of northern storms. The systems of force just specified are magnetic, so adjusted as to make mean angles at the surface of the earth, and a constant value for each station, so that the total impressed force is on the average proportional to the horizontal component. Hence, in studying relative variations, this latter can be used as an approximate substitute for the total force, and the bifilar becomes the instrument for useful work. If bifilars could be placed in the zone of the maximum frequency of auroras, they might be a fairly reliable measure of the quantities desired. Unfortunately the observatories available (Toronto, Washington, and San Antonio) are all located in the zone where the exflected and the inflected systems meet together, and there is, in consequence, a very unsteady direction to the impressed field, so that the horizontal component cannot be supposed to hold a very constant ratio to the total vector. Therefore, within this zone the action of the bifilar can only imperfectly record the changes in the solar field, though it is evidently much more valuable than the declinometer or the Lloyd's balance. In the curves published in the WEATHER REVIEW no attempt was made to correct for temperature or other instrumental conditions, because it was desired to see how far the readings of the bifilar could be utilized in their crudest form, such as might be necessary to adopt in any extended use of this form of apparatus. A reasonable steadiness of temperature, and photographic registration of the trace can be secured at very inconsiderable outlay for equipment and maintenance.

With regard to the meaning of the magnetic curves, the following considerations must be mentioned. The primary cause of atmospheric circulation is, of course, the equatorial accumulation of heat from the electro-magnetic radiation of the sun. This maintains a system of atmospheric circulation of warm and cold currents of a very complex character, which are chiefly the source of the highs and lows seen upon the daily maps. My researches show that the magnetic energy of the polar field is added to this as a secondary source of action; it supplements, but does not supersede, the former. The probability is that 25 or 30 per cent of the disturbances in the weather conditions of the region designated as "the extreme northwest" will be traced to this source, from whence the extension and dissipation occurs chiefly in the United States. But it must not be overlooked that prevailing conditions are largely due to tropical convection, and that the synchronism between this and the polar magnetic energy may often become distorted. Such is the case in the summer, when the action due to the polar magnetism of the sun is greatly reduced in effectiveness, and in the winter, when the convectional discharges (*i. e.*, the cold waves) become very violent and disturb the fundamental magnetic pulsation (*i. e.*, the maxima and minima of the 26.68 period).

An examination of the curves of magnetic force and atmospheric pressure and temperature for the year shows that there is a synchronous variation maintained in all three curves for long intervals; that this harmonious beat is sometimes broken up, but soon restored. One should not expect to find such complete harmony as usually exists between the curves of mean daily pressure and temperature; it would be unphilosophical to disregard the well recognized facts that the instrumental conditions are incomplete, and that the effect of magnetic energy is not fully separated from the dominating convectional currents of the atmosphere. As matters now stand we see that (1) 75 per cent of the changes in the curvature of the magnetic curves agree quite well with those of the temperature and pressure curves; (2) that the amplitudes are about as reliable as the phases; (3) that the magnetic force is precedent, and that the highs and lows may lag a little in their formation; (4) that the fact that the magnetic observations are made 2,000 miles away to the southeast of the indicated seat of energy excludes the idea that the variations of atmospheric temperature were the cause of the simultaneous magnetic changes. These practical matters are clearly in a very elementary condition, but the prospects are good that they will be improved. For several reasons there is an increasing demand for better and more magnetic observations, so that it is very much to be regretted that one of our three American observatories has discontinued its operations, and that all three have suffered (especially as to the record of vertical force) by the introduction of electric trolley lines in their neighborhood. The Weather Bureau desires to acknowledge the courteous and generous cooperation it has received from the director of the magnetic observatory at Toronto, the superintendent of the Naval Observatory at Washington, and the superintendent of the U. S. Coast and Geodetic Survey which maintained a temporary observatory at San Antonio.

Beginning with the month of October, 1895, the presentation of the data will be given in a somewhat different form, aiming at greater accuracy in the comparison of the two types of physical elements.

NOTES BY THE EDITOR.

FLORIDA FREEZES FOR A CENTURY AND A HALF.

The following paper, read May 8, 1895, by George R. Fairbanks, is reprinted from pp. 16–20 of the Proceedings of the Eighth Annual Meeting, Florida State Horticultural Society. The data given in it will prove useful for future reference:

The earliest authentic record we have of severe cold weather in this State is in the year 1766, just after the transfer of the Floridas to England.

The night of January 2, 1766, John Bartram, the botanist, says, "was the fatal night that destroyed the lime, citron, and banana trees in St. Augustine, many curious evergreens up the river that were nearly twenty years old and in a flourishing state, the young green shoots of the maple, elm, and pavia, with many flowering plants and shrubs never before hurt."

Bartram, who was then camping on the St. Johns River above Volusia, says: "The morning of the 3d was a clear, cold morning; thermometer, 26°; wind, northwest. The ground was frozen an inch thick on the banks." Bernard Romans, in his Natural History of Florida (1775), says: "On January 3, 1766, a frost destroyed all the tropical productions in the country, except the oranges. The Spaniards called this a judgment on the place for having become the property of heretics, as they never had experienced the like."

In 1774 there was a snowstorm which extended over most of Florida. The inhabitants long afterwards spoke of it as an extraordinary white rain.

In 1799 the temperature was very low. On the 6th of April, 1828, a heavy frost was very destructive to vegetation; the temperature at Picolata was as low as 28°.

The great freeze, par excellence, occurred in 1835 on the 7th of February, when the temperature went as low as 7° above zero. John Lee Williams, writing in 1837, gives the following account of the great freeze of February, 1835:

"A severe northwest wind blew ten days in succession, but more violently for about three days. During this period the mercury was 7° below zero." [This is undoubtedly an error, and should read *above* zero instead of *below*.—G. R. F.] "The St. Johns River was frozen several rods from the shore, and afforded a spectacle as new as it was distressing. All kinds of fruit were killed to the ground. Many of them never started again, even from the roots. The wild groves suffered equally with those cultivated as far south as 28°."

He further remarks that in 1837 the wild orange groves south of Volusia and at New Smyrna were in full bearing, which shows that they were not much injured. In 1844 the writer saw very large sweet orange trees on Drayton Island bearing fruit, which could not have been killed down in 1835.

There has been some question as to the exact date of the freeze of 1835. I think there is no doubt that it occurred on the night of the 7th and morning of the 8th of February, 1835. Paragraphs in Nile's Register, February, 1835, state that the mercury was 1° below zero at Baltimore, and 1° above zero at Raleigh, N. C., on the morning of February 8, 1835. That month was excessively cold, the Chesapeake having been frozen so as to close navigation three times during that month. The mercury is reported to have been at 11° above zero at the same period at Fort King, Fla., then an army post near the present Ocala.

Dr. Baldwin of Jacksonville, an excellent authority, informed the Times-Union in 1886, that the date of the freeze in 1835 was the 8th of February, and the mercury stood at 8° above zero; and that about 1857, the day not given, the temperature was down to 16°. In 1857 the mercury fell to 26° at Tampa, 29° at Fort Pierce, and 30° at Fort Dallas, on the Miami. At Jacksonville the thermometer indicated, viz:

	°
January 16, 1857	16
December 28, 1872	27
January, 19, 1873	24
December 28, 1875	28
December 3, 1876	24
December 28, 1878	27
January 7, 1879	25
December 30, 1880	19
January 6, 1884	21
January 12, 1886	15

At Sorrento, on January 12, 1886, the thermometer indicated 19.

P. P. Bishop, in an address before the Fruit Growers' Convention, about 1872, said: "At Christmas, 1868, and again at Christmas, 1870, we had the two severest frosts that have been known in Florida since 1835. At each of these dates many young buds were ruined, many young seedlings frozen to the ground and much fruit destroyed."

With the foregoing statistics before us we are prepared to institute a comparison of the severe freezes we have had in Florida in 125 years at Jacksonville as a basing point.

	°
February, 3, 1766 (probably)	20
February 8, 1835	8
January 12, 1886	15
December 20, 1894	14
February 8, 1895	14

In 1766 the effects of the freeze were confined to loss of tropical plants, etc. That of 1835 destroyed all oranges, lemons, etc., north of 28° N. Lat. That of 1886 destroyed many young trees, and some old trees, but did not affect the crop of fruit in the following year in quantity, though it did in quality. The freezes of 1894–5 appear to have pretty generally killed down lemon trees, grape fruit, and young budded stock and many large trees; but according to present appearance (May 1895) old bearing trees will fruit for part of a crop the coming year.

In addition to the preceding, Mr. Fairbanks says:

Governor Glen of South Carolina, in a pamphlet published in London in 1761, says "that on the 7th of February, 1747, the temperature at Charleston was as low as 10° at 8 o'clock in the morning, and had been lower during the night; that all bearing orange trees were killed to the ground, and even an olive tree eighteen inches in diameter."

NOTE.—The lowest temperatures in Florida, as given by Schott in his temperature tables, are as follows:

Station.	Temperature.	Date.
Fort Barancas	10° F.	Jan., 1852
Fort Brooke	26	Jan., 1827, and 1857.
Fort Dallas	30	Jan., 1857
Fort Jefferson	42	Dec., 1868
Fort King	11	Feb., 1835
Fort Marion	21	Jan., 1831
Fort Meade	24	Jan., 1852
Fort Myers	31	Jan., 1852
Fort Pierce	29	Jan. and Dec., 1851 and 1857.
Indian Key	47	Feb., 1836
Key West	44	Jan., 1857

For South Carolina, Schott gives:

Station.	Temperature.	Date.
Charleston	16	Jan., 1852
Fort Moultrie	6	Feb., 1835

DROUGHTS IN THE MISSISSIPPI VALLEY.

The annual report of the Iowa Weather and Crop Service, for 1894, contains an admirable article by the Director of the Service, J. R. Sage, on the "Drought Problem." Among the many excellent sentences we quote the following:

> The question most vitally affecting the dairy industry is that relating to the permanence of the climatic conditions. Confidence is the basis of all business activity. We know what the past has brought forth, but what of the future? Are our droughty summers and hot winds to be the rule, instead of the exception, for many years to come? * * * The unusual experience of the past season has stimulated public interest in some of the problems of meteorology, and people are making the discovery that the tables and records of the weather clerks are not merely dry figures, after all, nor wholly devoid of value to practical people. The droughty season stimulated the growth of a great variety of theories and speculations. Now, it is a good thing to quicken inquiry and investigation, but it is still better to obtain correct answers. An interrogation point, like a corkscrew, may uncork healing balm or deadly poison. Can we make it rain? Why this extraordinary shortage of rain? What is the matter with our climate? Is this aridity the result of drainage and cultivation? These are questions that have agitated the community.

The author goes on to maintain that we can not make it rain, that neither rain nor drought are caused by human agencies, but by gigantic natural forces infinitely above the grasp of finite man. He shows that the records for past years demonstrate great variability in climates and in crops, but nothing to prove a permanent change. He gives a letter from the Hon. Charles W. Irish, describing the great drought of the summer of 1846, in Iowa, which corresponded to, and was, perhaps, a continuation of the drought of 1845, in Ohio, and that of 1844, in New England. From all appearances these three droughts were quite as severe as those of 1893–1895. He further shows how possible it is that droughts may be compatible with good crops of grain, if not of grass. As droughts alternate with very wet seasons, there is, therefore, no evidence whatever that civilization has affected the climate so far as concerns cloud and rain. The weekly Weather Crop Bulletin shows that the rain that usually falls over Iowa has simply passed by, and brought an excess to other sections. As the past is the best possible guarantee for the future, therefore we may still expect dry and wet seasons in about the average number and average irregularity. It is not well for man to give up in despair and retreat from the lands that he has attempted to occupy, but rather learn how, by forethought, to conquer a success in spite of the difficulties that nature presents. "By thorough drainage, subsoiling, the conservation of moisture by means of shelter belts of timber, artificial ponds, and artesian or deep wells, we shall, in time, be able to produce abundant crops and water our stock, whether the seasons be wet or dry."

THE WEATHER IN DISTANT REGIONS.

It has been abundantly shown that the prediction of the weather for a long time in advance must depend largely upon our knowledge of the conditions prevailing at the time of the prediction in different portions of the globe. In order to lay a proper foundation for the study of this subject we must have monthly, if not daily, charts of the temperature, pressure, moisture and winds over the whole globe, such as have been prepared and partly published under the title of International Simultaneous Observations. These charts for the years 1875 to the present time have been used hitherto principally as a means of studying the motions of low areas, or what is called the general circulation of the atmosphere in the Northern Hemisphere. Such studies have already shown that the phenomena of the Southern Hemisphere obey the same laws as hold good in the Northern Hemisphere, but in much simpler combinations, and that maps of both hemispheres, when compared together, mutually elucidate each other. It sometimes happened that cold, dry, and clear sea-

sons in the north temperate and arctic regions continued from six months before to six months after corresponding cold winters in the extreme southern temperate region. The latitudes visited by vessels that round Cape Horn are usually a little less than S. 60°, corresponding, therefore, to Behring Sea, southern Alaska, Cape Farewell, the Orkney Islands, Christiania and St. Petersburg, and, in fact, are very little farther south of the equator than the routes followed by the steamers from Glasgow to North America are north of the equator. The fact that there is so much more ice in these southern latitudes than in the corresponding northern latitudes must be attributed largely to the winds of the antarctic regions and the distribution of ocean and land. Any special increase or diminution in the ice, either arctic or antarctic, must result from a change in the winds; it may be in their direction, or force, or temperature, or moisture. Whatever the cause of that change in the wind, it must affect a large portion of the Southern Hemisphere appreciably. If, however, the ultimate cause consist, in some phenomenon peculiar to the equatorial regions, it may affect both the arctic and antarctic simultaneously. In fact such conditions may prevail over the whole north temperate zone as to influence the circulation of the atmosphere in the south temperate and antarctic regions, and this influence may either be direct and simultaneous, or indirect and only apparent after many months.

A consideration of the mechanics of the atmosphere justifies the collection and intercomparison of even the popular news items in the daily press describing special and abnormal phenomena in distant places. As far back as 1780 Dr. E. A. Holyoke, of Salem (Memoirs Am. Acad., Vol. II), made a comparison between the weather on opposite sides of the Atlantic Ocean, hoping to discover some simple reason for the contrasts between the two regions. We, on the other hand, are now tempted to compare together the weather of the arctic and antarctic circles. There have opportunely come to hand a few reports from vessels off the coasts of Alaska and Patagonia. A letter published in the San Francisco Chronicle of October 8 from the fleet of whalers in the Behring Sea, dated August 14, 1895, states that—

> On sailing northward in July from Unalaska ice was met within about 100 miles, and was always present until reaching Port Clarence, and that it had never before been seen so near to Unalaska by any one. From Port Clarence to Point Barrow the vessel's progress was exceedingly slow on account of the drifting ice, scarcely a mile having been made in the first fifteen days of August. The northeast wind that usually keeps this ice off shore has been wanting.

Dr. Sheldon Jackson, agent for the Bureau of Education, reports a similar experience by the revenue cutter *Bear* while north of Behring Straits. The southern edge of the arctic ice pack had remained so far south as to prevent any passage north of Icy Cape from July 19 to August 22. Parties from Point Barrow who had traveled down the coast for their mail, report that the past winter, 1894–95, had not been very cold, the lowest temperature being —30°. (See the National Geographic Magazine for January, 1896.)

We are not to infer from the above that there has been unusual cold or an unusual quantity or thickness of ice, but simply that the wind failed to counteract the ocean currents that drifted the ice on shore.

From the Los Angeles Express of Nov. 26, 1895, we learn that the British ship *Anglesey* arriving at San Francisco on that date, like every other vessel that has arrived at that city after rounding Cape Horn during the summer and autumn of 1895, reports an unusual quantity of ice in that region, and corresponding unusual storms and freezing weather and snow. Usually a northwest wind drives the antarctic ice southward, just as a southwest wind drives the arctic ice northward.

We may infer that there has, during the past July and August, been a diminished tendency to northwest winds near the antarctic circle, while, at the same time, there was a diminished tendency to northeast winds in northern Alaska.

As the winds in northern Alaska are associated with the low pressure area in Behring Sea the abnormal wind conditions indicate an abnormal condition of that low area, and, in fact, it was probably at this time almost entirely obliterated by an unusual northward extension of the great high area of the North Pacific, which area also brought cold weather to the Pacific Coast States.

As the westerly winds at Cape Horn represent a general circulation around the low area of the Antartic Continent, and as the winds at the Cape are usually northwesterly, blowing outward from the high pressure area of the South Pacific, we must infer that the absence of northwest and the presence of southwest winds in this region implies a diminished activity of the high area in the South Pacific.

Now, this tendency to an increased activity of the northern area is but an exaggeration of what ordinarily takes place in the changes from January to July, or winter to summer, in the Northern Hemisphere; similarly, the tendency to a diminished activity of the southern high area is an exaggeration of what takes place in that region in the transition from July to January (winter to summer) in the Southern Hemisphere. Both these changes are, therefore, in harmony with those variations in the general circulation that depend upon the interactions of oceans and continents. The change in the North Pacific area is that which would be produced by an increased contrast of land and water in the northern summer, and the change in the South Pacific high area is that due to a diminished contrast between land and water in the southern winter season. Therefore, in the north, or summer, the continental air has been warmer than the oceanic air, but in the south, or its winter, the continental has been cooler than the oceanic air in the region of high pressure. Both of these changes may be plausibly traced back to some one single cause, such as an increased dryness of the atmosphere, which makes hotter summers and colder winters. Although the latter suggestion may not present the true cause in this specific case, yet it often may be applicable to similar cases, and it seems to enforce the general principle that widespread and persistent seasonal variations of climate may result from a very slight general disturbance in the quantity of moisture in the air, or an excess of ascending or descending movements in the atmosphere.

THE LOCAL STORM OF SEPTEMBER 8 IN KANSAS.

The map of Sunday, September 8, at 8 p. m., shows a general movement of the wind from south and southeast over Texas, Missouri, Illinois, Indiana, and thence northward to North Dakota. This movement may be considered in either of its aspects, viz, either as a flow of air towards a special low pressure in Alberta, or as a flow toward the high, warm tableland constituting the eastern slope of the Rocky Mountains. A barometric pressure of 29.7 or 29.8 prevailed over the greater part of the Plateau Region, and a temperature of 80° or 90° prevailed from Nebraska south and east over the Gulf States, with generally clear weather. As there was no strongly developed low pressure, therefore the local showers that occurred, with thunder and lightning, during the 8th and 9th, must be considered, not as an essential part of a system of cyclonic circulations, but as local incidents due more particularly to special local influences. The locations of such storms, with reference to the center of low pressure, has but little significance as compared with their locations relative to the winds and local topography. However, an exception must be made in respect to the storm that occurred on the 8th, a. m., in Morris and Lyon counties, Kans., and moved thence southeastward to the southeast corner of the State into

Missouri, which was too large to be called a local storm; in fact, it seems to present phenomena characteristic of the southern end of all long troughs of low pressure. In this case the trough may be considered as extending, on the 8th, p. m., from central Kansas to southern Alberta. On the west side the cold, drier air over the Plateau Region was undoubtedly descending and pushing eastward, but had not yet made itself felt as a general westerly wind, except at Pueblo, Santa Fe, and Amarillo. In this region, which lies a little southwest of, and higher than, central Kansas, such winds prevailed, as would, by descending to the lower level of that State, produce the rise of 20° in temperature that was reported from Wichita and Dodge City, with corresponding falls in the barometer. This descending stream of air, having once reached the surface of the ground, and pushing eastward, must have presented the usual well-known appearance of an onward rolling or rushing wall of air, lifting up the lighter air in front, topped along its whole extent by a long and comparatively narrow belt of what might, to a distant observer, appear as one cloud, but which, on closer inspection, is seen to be a series of isolated whirls and hailstorms, horizontal rolls and straight-line movements, all in close juxtaposition and presenting a scene of violent, turbulent motion. At first the front was a small region, perhaps 5 miles long in the southeastern portion of Morris County, and northwestern portion of Lyon County, and therefore about 100 miles west-southwest of Kansas City, and was but the front of an entering wedge for the large mass of air to follow behind. About noon of Sunday, the 8th, the front was not only moving eastward as a whole, but also lengthening by its steady growth toward the southeast and the northwest, and by 8 p. m. had passed beyond Concordia on the north and Springfield (Mo.) on the east, and was near Kansas City. A description of the effects of the storm in southeastern Kansas, as compiled from the WEATHER REVIEW, for that State, would be about as follows:

On the east side of a line from Lyon County toward the southwest corner of Kansas the corn was blown down from the northeast and on the west side from the northwest to southeast, showing the path to have been about 25 miles wide; inside of this was an area of destructive hail about 15 miles wide, while beyond it was the area of excessive rainfall, about 60 miles wide. The hail lay in broad streaks or paths; all hailstorms [streaks?] on the east side of the center traveled [trended?] from northeast to southwest and on the west side, from northwest to southeast. In many of the hail streaks the leaves, fruit, and bark were stripped from the trees, and the next morning the groves were left bare, as in January; 4, 8, and 10 inches of water were measured in standard rain gauges, and a box standing isolated near the center of the storm path, 14 inches deep, was full of water on the morning of the 9th. This storm was succeeded by hot, dry weather. The electrical display was quite remarkable, and was reported by ovservers in Clay County, 120 miles west of Kansas City, and Reno County, 100 miles southwest of Morris and Lyon counties.

THE EARTHQUAKE OF SEPTEMBER 1.

This earthquake shook the whole of the region between Virginia and Maine, but did not extend west of the central portions of these Atlantic States. The time and character of the shocks are briefly given in the following summary:

Virginia.—Falls Church, lasted several seconds.

District of Columbia.—Washington, 6 hr. 8 min. 39 sec., a. m., by the Weather Bureau seismograph.

Maryland.—Westminster, 6.05; distinct trembling of the house for a few seconds.

Delaware.—Wilmington, slight tremor; duration one second, at 6.10.

New Jersey.—Perth Amboy, 6.08; lasted from three to ten seconds. Beverly, 6.10; lasted a full minute. Plainfield, 6.01; lasted ten seconds. Englewood, 6.10. Rancocas, 6.08. New Brunswick, 6.07. Moorestown, Newark, Clinton, Bridgeton, Oceanic, Elizabeth, Bayonne, Alaire, Somerville, Burlington, Palmyra, Freehold, and Toms River, recorded without details. Red Bank, not noticed by people out of doors, but distinctly felt by people inside of houses. Belmar, 6.08; accurately observed by Mr. Edward Brown. Asbury Park, loose plaster fell from the ceilings. Sandy Hook, in the Marine Observatory the tower shook slightly for about eight seconds. Jersey City, 6.10, at the Erie Railroad depot. Englewood, 6.10 exactly; oscillations lasted from eight to ten seconds. Port Jervis, 6.08. High Bridge, perceptible shock. Elizabeth, 6.15. Plainfield, 6.00. Trenton, between 5.00 and 6.00. New Brunswick, 5.50. Morristown, 5.45. Orange, not noticeable.

Pennsylvania.—Easton, church bell rang shortly after 6 a. m. Philadelphia, shortly after 6 a. m.; buildings swayed perceptibly. Allentown and Phœnixville, buildings swayed and many awakened from sleep.

New York.—New York, not so severe as that of August 10, 1884, August 31, 1886, or March 8, 1893; Weather Bureau office, vibrations for ten seconds at 6h. 11m. a. m. Staten Island, a strong, single shock, lasting ten seconds, occurred at 6 hr. 10 min. a. m. Governors Island, the ordinance sergeant was awakened by the shock. New York Harbor, the ferry boats rocked as in heavy weather, and a rumbling sound occurred as if the boats were scraping on the bottom. Long Island and Brooklyn, three distinct shocks; the earthquake generally travelled eastward, and was felt most decidedly on the south side of the island. Rockaway Beach, the sand continued in motion about two minutes, and the surf suddenly subsided. Bath Beach, two persons are said to have been thrown out of bed. Jamaica and Newtown, 6.05. Flushing, about 5.45. Northport and Mount Vernon, about 6.00. Yonkers, a little after 6.00. White Plains, 6.15. Sing Sing and Tarrytown, slight shock. Newburg, three gentle shocks felt at Washington Heights. Bedford, 6.06.

Connecticut.—Greenfield Hill (from the Bulletin of the New England Weather Service):

Uncorrected time, 6.08 a. m.; duration not over ten seconds; direction of movement nearly southwest to northeast. Only a few people were out at that hour, and not many of those few noticed the shock. In houses it was felt generally, and nearly all report having received the impression of the wave motion. Being in bed at the time, I felt the rocking motion; the jarring motion was felt faintly. A resident of the valley, about half a mile away from here, said his house was badly shaken. The shock passed away with a roaring sound similar to that sent back from water when a heavy gun is fired over it.

Connecticut.—Westport, houses swayed.

With reference to the accuracy of the determinations of the exact time of the earthquake shock at Washington, Mr. D. T. Maring, who (in the absence of Professor Marvin at Atlanta) was in charge of the Instrument Room at that time, writes as follows:

The time of earthquake shocks is recorded as follows: On a register cylinder, making a revolution every six hours, an ordinary office "regulator" clock marks off 5-minute intervals by closing a circuit through a magnet of the register about four seconds after the ending of each fifth minute of the hour. Whenever the needle of the seismograph is disturbed, it also records by closing a circuit through the same magnet that makes the clock record. Careful interpolation between the clock and seismograph records will, therefore, give the time by the "regulator" clock at which the needle of the seismograph was disturbed.

The accuracy of the interpolation between the clock and seismograph records will depend upon the definiteness and fineness of the lines made by the recording pen. In this particular instance the case is somewhat complicated because the seismograph record followed so closely after the clock record that the two are united into one wide mark, excepting at their points. The marks representing the clock records cover a space equivalent to about forty seconds of time, the variation in width not being greater than five seconds. The combined width of the two marks, as recorded in this instance, is equivalent to about sixty-five seconds of time on the sheet, while the distance between their points is equivalent to about twenty-five seconds. The time of the vibration of the needle of the seismograph here recorded appears, therefore, to have been made within five seconds of twenty-five seconds after the clock record was made, or at ten minutes twenty-nine seconds after 6 o'clock a. m., of September 1, 1895.

A more troublesome source of error, however, is found in the rate of the "regulator" clock. Reference to the accompanying diagram [not printed] will show that on different days the clock has gained as much as twenty seconds, or lost as much as thirty-seven seconds. For the seven days previous to September 1 the clock gained from eleven to seventeen seconds each day, the gain from noon of the 30th of August to noon of the 31st, being twelve seconds. From August 31 to September 3 no time observations were made, but during this period the clock lost twenty-eight seconds, or an average of nine seconds per day. From 9 a. m. to 12, noon, of the 3d, it gained three seconds, and from noon of the 3d to noon of the 4th, one second.

The noontime signals from the Naval Observatory are not received at this office by telegraph on Sundays nor holidays, and it so happened that September 1 fell on a Sunday, and was followed by a national holiday (Labor Day), September 2. It was not possible, therefore, to get a more accurate reduction to the actual Naval Observatory standard time than is here explained.

There seems to be no way of deciding accurately whether the regulator clock kept on gaining at the rate of twelve to fifteen seconds per day until after 6 a. m. of the 1st, or whether, between noon of the 31st and noon of the 1st it lost from twenty to forty seconds. There is, therefore, an uncertainty of at least thirty seconds in the error of the clock at 6 a. m. of September 1, and of five seconds in the interval of time that elapsed between the clock record and the seismograph record.

Adopting a mean rate for the clock from noon of the 31st to noon of the 3d, we obtain for the error of our "regulator" clock at 6 a. m. of September 1, + 1 min. 50 sec. Subtracting this error from 6 hr. 10 min. 29 sec., the time by the "regulator" clock at which the seismoscope needle was disturbed, we get 6 hr. 8 min. 39 sec. as the Naval Observatory standard seventy-fifth meridian time for the occurrence of this earthquake shock, which time is probably correct within twenty seconds.

The record of the Weather Bureau seismograph indicates that the *duration* of the shock was only a few seconds.

HOW TO OBSERVE AN EARTHQUAKE.

Prof. Charles Davison, of Birmingham, England, has been engaged for several years in studying and cataloguing the earthquakes of Great Britain, and has lately issued some instructions to observers, which are also applicable to other countries. The essential points are the following:

1. Always be prepared by keeping a written record of the correction to your watch or clock. If the record is made daily, by comparing your watch with the standard-time signal, or standard clock, and if you do not often adjust the watch, but keep its record continuously day after day, you will have the means of converting an observed time into standard time by making allowance for the error of the watch.

Immediately after the earthquake is over compare the watch or clock with other watches and clocks, especially the best standard-time clock accessible. The standard clocks of the ordinary jewelers are often allowed to be in error half a minute and are rarely adjusted to absolute correct time more than once a week or month, but by cultivating a friendship with the jeweler you can generally obtain the exact error of the clock, provided the information is to be used only for strictly scientific purposes. The standard noonday-time signal, which is flashed all over the country daily by telegraph, should always be used when possible. It can be observed at any telegraph office, and is often distributed by telephone. It is very desirable to observe the time of the shock and determine the error of the watch to the nearest second. All records should be kept in seconds, even although there may be a possible error of many seconds. Ordinary watches are liable to an irregularity in their daily rate so large that they may gain or lose ten seconds in twenty-four hours without any special apparent cause. Therefore the observer must compare his watch with the standard clock as soon as possible after the earthquake has happened. Clocks having wooden pendulums, beating seconds or half seconds, are more reliable than ordinary watches. Clocks having metallic pendulums, without compensation for changes of temperature, are less reliable than the best of the high-grade watches.

2. The most important item is the time of the instant when the strongest shock occurred. If no shock was especially strong, then record the time of the beginning and also that of the ending of the vibrations; if no shock at all is felt, record the time when the loudest rumbling noise was heard.

3. Record the nature of the shock: (*a*) Was any tremulous motion felt before the principal vibrations, and for how many seconds? (*b*) How many principal vibrations were felt, and for how many seconds did they last? (*c*) Was any tremulous motion felt after the principal vibrations, and for how many seconds? (*d*) Did the shock gradually increase in intensity and then gradually die away, or were there two or more maxima or a series of vibrations; and if so, how many were there, what were the intervals between them, and what was the order of their intensity? (*e*) Were the principal vibrations strongest near the beginning, middle, or end? (*f*) Was any vertical motion perceptible, and if so, was the movement first upward and then downward, or vice versa?

4. *Duration of the shock in seconds.*—This may be estimated after the observer has recorded the minutes and seconds of the strongest shock. To do this he should repeat at his leisure the various movements and operations that he himself went through when he observed the earthquake, and should time himself while so doing.

5. *Intensity of the shock.*—(*a*) Making windows and loose things rattle. (*b*) Perceptibly moving a chair, or bed, or the observer. (*c*) Stopping clocks, or making pendulums, pictures and chandeliers swing. (*d*) Overthrowing small ornaments or breaking the plaster from the ceiling. (*e*) Throwing down well built chimneys or cracking well built walls.

6. *The sounds.*—(*a*) Was there any unusual rumbling? (*b*) By how many seconds did the first sound precede or follow the first quaking of the earth? (*c*) By how many seconds did the last sound precede or follow the last shock? (*d*) Did the sound entirely precede, or entirely succeed the shock, and by how many seconds? (*g*) Was the sound loudest before, or at, or after the instant when the shock was strongest?

Special interest attaches to these last questions about the relation between the movement of the earth and the sound in the air. While the earthquake lasts the whole attention should be given to observing the nature of the shock and sound and their relations to one another, and their variations in intensity and character. During this time one may look at his watch and make some mark that will assist the memory, but need not write down anything except what relates to the sounds and shocks until the latter are entirely recorded, after which he may write down the record of times of beginning, maximum, and ending.

If more than one shock is felt the descriptions of the different shocks should be kept separate; slight shocks are just as important as strong ones. If you know that you are in the neighborhood of an earthquake disturbance, which you did not yourself experience, although you were in a favorable condition to do so, it is important to record that fact.

[NOTE.—The Editor has several times found by experience that when it is difficult to count the rather rapid vibrations of a building, it is still perfectly practicable to let a lead pencil held loosely in the hand trace a zigzag line that shall be a correct, graphic presentation of the number and intensities of each individual vibration, and this zigzag can be repeated an hour afterwards quite perfectly, both as to character and time. By counting the zigzags we thus determine the total number of vibrations, and by timing the process repeatedly we get a clear idea of the duration. Thus in the autumn of 1886 a building in Washington vibrated seven or eight times in the space of two seconds, and repeated this performance five times over within two minutes. In each case the first vibration was the largest, and the others steadily diminished to the end. Moreover, the last group was feebler than the first group.

After all that may be said in favor of personal observa-

tions (and they certainly are of the highest importance when we try to consider all the features of time and duration, intensity, and direction and the attending noises) still, owing to the fact that observers are generally taken unawares, the Editor must urge those persons, and especially those institutions that can afford to maintain a Weather Bureau seismograph, to contribute thus greatly to our knowledge of this subject. In the annual report of the Chief Signal Officer for 1875, pages 374–377, the Editor submitted a few suggestions as to the observation of earthquakes. Among the apparatus for recording direction the following suggestion may be worth considering: The linear extent of the horizontal movement of the earth may be computed from the movements of several heavy balls of different diameters and moments of inertia rolling or sliding on a perfectly horizontal plane. The plane should be strewn with a fine powder that will serve to mark the path of each ball. The balls should be covered with a very thin layer of some lubricant, such as tallow, to which the powder will stick if the ball should roll. The plane should have a rim and a glass cover to exclude dust and wind. Every detail of the motion of the balls will thus be recorded on their own surfaces and that of the plane. The horizontality of the plane must be determined after the earthquake shock as well as before. The balls must be as truly spherical and homogenous as possible, and, in order to secure different sizes and densities one might, for economy's sake, use the steel balls of the bicycle axles, the best of agate marbles, billiard balls of ivory and the Japanese spheres of quartz crystal. From the recorded movements of these balls one may deduce the direction and force with which they were projected from their original position of rest by the earthquake shock, but the computation, of course, involves a knowledge of dynamics.]

FROSTS IN SOUTHERN CALIFORNIA—THEIR PREDICTION AND PREVENTION.

The following article from the Los Angeles Express of January 4, 1896, presents the valuable results of much experience in that region, and may apply, with slight modifications, to some other portions of the country:

One of the most reliable horticulturists of this section, James Boyd, of Riverside, has laid down some rules bearing on this subject, in the Press, that are interesting, and their correctness is vouched for by years of experience and observation. He states that, as a matter of fact, the thermometer has seldom been known to fall between sunset and sunrise more than 10° in a cold wave, or, say, to make sure, from 7 to 8 o'clock at night to the same hour next morning. For instance, if the thermometer is above 40° at 8 o'clock at night, it need not be expected to fall below 30° before the next sunrise, although sunrise sometimes witnesses a fall of a degree or two for a few minutes, which usually does but little harm.

Again, if the wind blows all night, no matter how cold it feels, it will not freeze to hurt anything in the orchard; but if the north wind blows cold all day and dies down about sundown, with snow on the San Bernardino Mountains, it is well to prepare for the worst. But, again, if the barometer is low there will not come a destructive freeze. All of our injurious frosts have come with an exceedingly high barometer, and, no matter how much it may threaten, the cold is not likely to be excessive. The thermometer may stand for hours below the freezing point without freezing the fruit. If, on cutting the fruit, the juice flows freely it is not damaged. It must not be forgotten that it takes a much greater degree of frost to freeze a mixture of salt and water or sugar and water than of pure water, which fact is what saves the fruit; and green fruit is much more easily damaged than that which is ripe; a fact that is demonstrated every season in our vineyards, where immature grapes will be frozen while ripe fruit will be untouched.

There is one other point that may be laid down as a certainty, and that is, that the thinnest film of haze overcasting the sky will immediately raise the temperature several degrees. It is better not to run water, except when all signs point to a general freeze, for undoubtedly much harm results to the orchard, and also to the fruit, from having the ground saturated for days, or even weeks, at a time, for rain usually follows any cold spell in a few days, and the constant wetting of the soil is very apt to produce puffy fruit later on.

RATE OF ADVANCE OF RIVER FLOODS.

The rate at which river floods advance down the stream must, of course, depend upon the nature of the bed of the stream and the extent to which its banks overflowed. The cross section of the flood of water becomes so large in the lowlands and flats that the forward advance is correspondingly small, and, in fact, every broad piece of overflowed bottom land becomes a pond, temporarily, in which waters may accumulate, and thus diminish the severity of the flood in the lower parts of the stream. Each stream has, therefore, peculiarities of its own and demands a special study. The rates of advance derived from the study of one river can not be applied to another without material multiplication. As, however, detailed studies upon river floods have as yet been made in only a few river valleys, we submit the accompanying report, extracted from the proceedings of the Rochester Academy of Science, as illustrating the class of work that might profitably be repeated by engineers, for the smaller rivers at least, throughout the country. When we know at what rate the small rivers feed the larger ones we shall be better able to study the floods in the latter.

Mr. J. Y. McClintock, surveyor for the city of Rochester, having returned from an examination of the Genesee River in May, 1894, gave an address, of which the following is a summary:

We have lately seen in the Genesee Valley the third greatest flood that has occurred for thirty or forty years. Studies have been made to determine at what rate of speed the height of the flood traveled from Mount Morris to Rochester, and as this flood ran great enough to cover the broad flats it gave a good example. I found that the flood was at its height as follows: Mount Morris, May 21, 3 a. m.; Geneseo, May 21, 12 m.; York, May 22, 9 a. m.; Avon, May 23, 6 a. m.; Rochester, May 23, 2 p. m.

The distances down the general course of the valley are as follows: Mount Morris to Geneseo, 5¼ miles; Geneseo to York, 3 miles; York to Avon, 5¼ miles; Avon to Rochester, 18 miles.

This shows that the flood starting from Mount Morris moved at the following speeds: To Geneseo, 0.6 mile per hour; from there to York, 0.14 mile per hour; from there to Avon, 0.21 mile per hour; and from there to Rochester, Court Street dam, 2.25 miles per hour. The total time from Mount Morris to Rochester, 59 hours.

Apparently the velocity increases gradually, although not regularly, depending upon the width of the valley, which is very much narrower below Avon than above, and affords less storage capacity.

From our observations at Rochester we had come to the conclusion that the flow of water during this flood was nearly one-third less than the flow of 1865, when so much damage was done. I was able to verify this conclusion by interviews with old residents at various points along the river. At York the high water of 1865 was about three feet above that of 1894. At Avon it was somewhat over two feet above.

One other important point was as to whether the great flats would furnish storage room for the flood below the surface of its ground to any such extent as is usually assumed. This I was able to learn by ocular demonstration.

The river banks proper are generally quite steep, of clayey soil, from 8 to 12 feet high, and as the level of the river had fallen from 12 to 15 feet within a few days, the ground has not had time to dry out, but was exuding water from its whole surface. This showed that the flats act as a great storage. The importance of this will be shown by Mr. Rafter in his forthcoming report on the proposed storage dam. He will call attention to the fact that the 60 to 80 square miles of flats when soaked with water will hold far more than the great reservoir to be made.

STORM WAVES ON THE GREAT LAKES AND THE OCEAN.

The waves that occur on a body of water are of several kinds and origins. We speak of short waves and long waves when we have in mind those that can be seen in their whole extent from any ordinary point of view. The lengths of such waves, from crest to crest, vary from a few yards to a mile. We speak of a ground swell, or a long swell, when the rise and fall of the water is but a few feet, and takes place so gently that we scarcely see it as a wave on the surface of the water, but either feel it by the motion of the vessel or recognize it by the character of the surf. The small waves due to light winds, or to the interference of two opposing currents of water, are generally known as ripples or rips; there is, however, a still smaller wave known as the capillary ripple, which does not concern us here. Some forms of ocean swell are due to distant storms whose violent waves have, in the

course of 1,000 miles, subsided into long and gentle swells. Other forms of ocean swell are due to earthquakes or volcanic eruptions that produce a great commotion in some central locality whence the wave spreads in all directions. The longest and gentlest wave is the primary tidal wave which is the source of the ordinary tides in harbors and gulfs; this primary wave has a central height of only a few feet in mid-ocean, and would have a length from crest to crest of half the circumference of the earth, were it not for the interference of the continents. The tidal wave advances westward at the rate of 15° of longitude per hour. All waves, including the tide, become shorter and turn into breakers when they reach shallow water. All waves are reflected from the shore line as a wave of sound would be from a stone wall. By combining together several small waves there may result a special great wave. When a broad wave meets and passes beyond an obstacle, the deflected waves interfere with each other in the rear of the obstacle.

The bottom of a lake may be so shaped and so adjusted to the water it contains that the distance from one side of the lake may be exactly one-half of the wave that would naturally be formed in water of that depth, so that the water in the lake can be set into such a wave motion that as it goes down on one side it rises on the other and vice versa. In such cases observers on opposite sides of the lake simultaneously record high water and low water, respectively. This class of waves was first observed in certain lakes of Switzerland, where these waves were known as "seiches," but similar phenomena have been observed in all other parts of the world. This French word indicates a drying-up or retreating of the waters from the shore line, which retreat or apparent drying up may last for several hours, as a maximum, down to several minutes, as a minimum, depending on the dimensions of the lake. If such a phenomenon, or any similar long and slow wave should pass from one end to the other of any one of our large lakes, the amount of rise and fall at either end would depend largely upon the configuration of the sides and shores of the lake.

Another class of waves is due neither to tides, earthquakes, nor winds, but to changes in barometric pressure. We ordinarily measure the pressure of the air by the height of the column of mercury in the barometer, which is supported by the pressure at the open end of the tube, and when we speak of a pressure of 30 inches of mercury we really mean a pressure of about 15 pounds to the square inch, so that each inch of the mercurial column may be considered as representing a half pound of pressure to the square inch. If for mercury we should substitute a column of water it would need to be 34 feet high, as in the water barometer first made by Otto Guericke in 1650 at Magdeburgh. If, therefore, the barometric pressure is one inch higher or greater at one end of a lake than at the other, there is a decided tendency for the water to sink under the heavy pressure and rise under the lighter. Of course, in the free air, such differences of pressure can only exist in connection with a system of winds, and, therefore, the so-called barometric wave is generally of less importance than those due to the direct action of the wind.

It is important for the student to carefully distinguish between these different kinds of waves. Our progress in understanding and explaining the phenomena of nature and our hope of predicting them for man's safety, or utilizing them for man's necessities, all depends upon our correct appreciation of natural causes and our understanding of the laws of nature. As illustrating the confusion of ideas into which the public and well-trained observers may fall, we may quote the rise of water observed at Duluth on Saturday, September 28, when a storm center passed over or near the city. The minimum pressure was 29.68 at 8 a. m., reduced to sea level, while the isobar of 30.15 skirted the eastern shore of the lake. This difference of pressure of about 0.5 inch in a distance of 300 miles was, of course, accompanied by southeast to northeast winds and rain over the greater part of the lake east of Duluth. At the latter city the lake water rose from 2 to 4 feet, according to locality, and this was popularly spoken of as a notable "tidal wave." Now, the fact is, that tides are barely perceptible to close observation in Lake Superior, and tidal waves of 2 feet are impossible. One correspondent explains the wave as due to the difference of barometric pressure; but a half inch of the mercurial barometer corresponds only to a half foot of water, and even this is much more than could possibly have been caused by the barometric conditions over Lake Superior, unless they had remained intact for several days in order to give the water a chance to move into a position of static equilibrium. Even if such static equilibrium should occur, the water would need only to rise a quarter of a foot over the west end of the lake in order to counterbalance the depression of one-fourth of a foot at the east end. But the rise of water observed at Duluth on September 28 was not a case of static or barometric equilibrium, as the reader will see at once, from the fact that the isobars rapidly changed their location and the great difference of pressure soon disappeared. Similar unexpected rises and falls have sometimes been attributed to possible earthquakes, but this hypothesis is probably always out of place in connection with our Great Lakes.

There remains nothing but the wind as a probable cause of the wave at Duluth, and, in fact, the gale that prevailed on Lake Superior, taken in connection with the contour of the shore line, is fully adequate to explain the phenomenon.

The explanations that we have given in previous numbers of the MONTHLY WEATHER REVIEW of the floods caused by hurricanes on our Atlantic and Gulf coasts, apply equally to the high water observed on the Lakes. The wind drives the surface water forward, but when the water reaches the shore and begins to pile up, because it can no longer go forward, it then returns toward the sea by flowing either to the right or to the left, or downward and backward, as an undertow. This forward flow above, and return flow below, is maintained by the wind in such a way as to constitute dynamic equilibrium, but not static equilibrium. If we had to consider only static equilibrium, we should find that a gale can support the pressure due to the weight of only a few inches of water; but in dynamic equilibrium, the steadily blowing wind is perpetually communicating to the onward flowing water a small amount of force, which the latter uses up in overcoming the resistances (such as friction, the so-called viscosity, and the inertia of slowly moving masses). As the undertow flows backward, the forward or surface current has to rise over the underflow, and the work required in order to do this is done by the force that the wind communicates. If the wind blows steadily for a few hours there is established an almost perfect equality between the force communicated by the wind to the surface water and the work done by the advancing surface current and the descending undertow. When the movements of the wind, the upper and the lower currents of water, are all perfectly uniform, this condition is spoken of as steady movement, a stationary condition, or dynamic equilibrium. If the wind should stop suddenly the water would, by its inertia, continue in motion until frictional resistances could use up its slight store of energy, after which it would lie still and the upper surface would be horizontal; this latter is also a stationary condition, but it is static equilibrium; there is no motion, therefore no frictional or other resistances, and therefore, no dynamic manifestations.

The temporary rise and fall of water on our lakes must be principally due to the wind. The disturbances of barometric pressure, the fall of rain, and the tidal action of the sun and moon may contribute a very little to increase or to diminish the influence of the wind, but the latter is the important cause.

These waves should, therefore, not be called "*tidal* waves," but, rather, "storm waves" or "storm floods." A similar misnomer is noticed as to the heavy waves that sometimes unexpectedly occur on the Atlantic and Pacific coasts. Although these waves are generally due to distant earthquakes, yet they are often spoken of as "tidal waves," whereas they should be called "earthquake waves." The "bore," or wall of water, resembling an ordinary breaker, but on an immense scale, which advances up the deltas of many great rivers, and is especially well developed in the Bay of Fundy, is a destructive form of the tidal wave, while the gentle rise and fall of the tide along the coast is the ordinary, quiet form of the tidal wave. Another misnomer occurs in calling the greatest and destructive waves of mid ocean "tidal waves" when they approach like an overpowering wall of water. Thus, the steamer *Progreso*, when off the coast of Lower California, on September 29, encountered a wave that swept her from stem to stern. This is designated as a tidal wave by the daily newspapers, but was, properly speaking, a "storm wave," being a combination of two large waves, or possibly a huge "breaker," but not in any sense tidal.

We note here that the newspaper press reports of "damaging tidal waves" in Duluth Harbor on the 14th and 20th of September, 1895, were quite erroneous. The only important high water at that place was that of the 28th, according to the report of K. W. Brown, local forecast official, Weather Bureau. On Lake Ontario, however, there was observed on September 18, between 6 and 7 a. m., at Charlotte, N. Y., a fall of about one foot, followed by a rise of one foot. At some points on the sloping shore this recession of one foot may have corresponded to thirty feet of the slanting beach, and thus a wild paragraph "water receded thirty feet" was made to startle the country. Ingenious reporters even suggested that this wave in Ontario had come all the way from Duluth through the Lakes and Straits, Ste. Croix River, and Niagara Falls; an impossible performance that makes the suggestion seem ridiculous, although many took it in all seriousness.

METEOROLOGICAL TABLES.

By A. J. HENRY, Chief of Division of Records and Meteorological Data.

Table I gives, for about 130 Weather Bureau stations making two observations daily and for about 20 others making only the 8 p. m. observation, the data ordinarily needed for climatological studies, viz, the monthly mean pressure, the monthly means and extremes of temperature, the average conditions as to moisture, cloudiness, movement of the wind, and the departures from normals in the case of pressure, temperature, and precipitation.

Table II gives, for about 2,400 stations occupied by voluntary observers, the extreme maximum and minimum temperatures, the mean temperature deduced from the average of all the daily maxima and minima, or other readings, as indicated by the numeral following the name of the station; the total monthly precipitation, and the total depth in inches of any snow that may have fallen. When the spaces in the snow column are left blank it indicates that no snow has fallen, but when it is possible that there may have been snow of which no record has been made, that fact is indicated by leaders, thus (. . . .).

Table III gives, for about 30 Canadian stations, the mean pressure, mean temperature, total precipitation, prevailing wind, and the respective departures from normal values. Reports from Newfoundland and Bermuda are included in this table for convenience of tabulation.

Table IV gives, for 29 stations, the mean hourly temperatures deduced from thermographs of the pattern described and figured in the Report of the Chief of the Weather Bureau, 1891–'92, p. 29.

Table V gives, for 28 stations, the mean hourly pressures as automatically registered by Richard barographs, except for Washington, D. C., where Foreman's barograph is in use. Both instruments are described in the Report of the Chief of the Weather Bureau, 1891–'92, pp. 26 and 30.

Table VI gives, for 136 stations, the arithmetical means of the hourly movements of the wind ending with the respective hours, as registered automatically by the Robinson anemometer, in conjunction with an electrical recording mechanism, described and illustrated in the Report of the Chief of the Weather Bureau, 1891–'92, p. 19.

Table VII gives the danger points, the highest, lowest, and mean stages of water in the rivers at cities and towns on the principal rivers; also the distance of the station from the river mouth along the river channel.

Table VIII gives the maximum, minimum, and mean readings of the wet-bulb thermometer for 135 stations, as determined by observations of the whirled psychrometer at 8 a. m. and 8 p. m., daily.

The difference between mean local time and seventy-fifth meridian time is also given in the table.

Table IX gives, for all stations that make observations at 8 a. m. and 8 p. m., the four component directions and the resultant directions based on these two observations only and without considering the velocity of the wind. The total movement for the whole month, as read from the dial of the Robinson anemometer, is given for each station in Table I. By adding the four components for the stations comprised in any geographical division one may obtain the average resultant direction for that division.

Table X gives the total number of stations in each State from which meteorological reports of any kind have been received, and the number of such stations reporting thunderstorms (T) and auroras (A) on each day of the current month.

Table XI gives, for 38 stations, the percentages of hourly sunshine as derived from the automatic records made by two essentially different types of instruments, designated, respectively, the thermometric recorder and the photographic recorder. The kind of instrument used at each station is indicated in the table by the letter T or P in the column following the name of the station.

Table XII gives the records of hourly precipitation as reported by stations equipped with automatic gauges, of which 37 are known as float gauges and 7 as weighing rain and snow gauges.

Table XIII gives the record of excessive precipitation at all stations from which reports are received.

Table XIV gives a record of the heaviest rainfalls for periods of five and ten minutes and one hour, as reported by regular stations of the Weather Bureau furnished with self-registering rain gauges.

Additional information concerning the tables will be found in the January, 1895, REVIEW.

TABLE I.—*Climatological data for Weather Bureau Stations, September, 1895.*

Stations.	Elevation above sea-level, feet.	Length of record, years.	Pressure in inches.			Temperature of the air, in degrees Fahrenheit.								Humidity and precipitation.					Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Monthly temperature data since opening station.			
			Mean pressure, 8 a. m. and 8 p. m. +2.	Mean reduced.	Departure from normal.	Mean max. and min. +2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					Absolute maximum.	Year.	Absolute minimum.	Year.
New England.						63.5	+ 2.4										1.79	— 1.7													
Eastport	78	23	29.91	30.00	— .03	56.8	+ 1.6	79	22	64	40	14	50	28	48	76	2.00	— 1.6	7	6,389	sw.	32	e.	30	8	15	7	5.1	83	1889	36	1888
Portland, Me	108	24	29.89	29.99	— .06	61.8	+ 4.1	93	21	70	42	16	53	37	53	76	1.79	— 1.4	9	4,911	nw.	26	nw.	13	14	8	8	4.5	94	1881	33	1888
Northfield	872	9	29.11	30.04	— .03	57.8	+ 1.7	90	23	70	26	15	46	39	49	79	2.60	— 0.6	5	5,538	s.	35	s.	29	11	14	5	4.6	90	1895	25	*
Boston	135	25	29.91	30.04	— .03	65.7	+ 3.6	96	23	74	42	15	58	34	54	71	1.53	— 1.6	8	7,054	w.	33	sw.	26	13	10	7	4.3	102	1881	34	1879
Nantucket	14	9	30.04	30.06	+ .04	64.4	+ 1.5	86	22	70	48	15	59	21	58	82	1.69	— 3.1	11	6,295	nw.	25	sw.	29	13	9	8	4.5	86	1895	41	1888
Woods Hole	.....	18	.....	.....	.....	64.5	+ 1.1	84	22	69	47	15	60	18	.....	.....	1.22	— 1.3	9	9,327	s.	48	sw.	26	16	8	6	3.6	84	*	39	1888
Vineyard Haven	.....	9	.....	.....	.....	66.6	+ 2.2	91	23	74	46	16	59	21	.....	.....	1.15	— 3.4	8	.....	sw.	.....	.....	...	16	7	7	....	91	1895	38	1889
Block Island	27	16	30.03	30.06	— .02	65.0	+ 2.3	85	21	70	47	15	60	21	59	84	1.46	— 1.7	7	9,188	sw.	38	sw.	26	13	14	3	4.2	86	1881	42	1883
Narragansett Pier	.....	14	.....	.....	.....	64.2	+ 2.0	87	*	72	40	15	56	26	.....	.....	2.11	— 0.5	5	.....	sw.	.....	.....	...	17	6	7	....	89	1882	32	1888
New Haven	107	23	29.94	30.05	— .04	66.4	+ 4.0	96	21	76	40	15	57	31	56	74	2.51	— 1.4	7	5,946	n.	33	se.	29	17	10	3	3.3	100	1881	32	1888
New London	45	25	30.01	30.06	— .02	65.4	+ 2.5	93	22	73	41	15	58	25	59	82	1.68	— 2.0	7	4,088	n.	40	s.	29	17	9	4	3.2	93	1895	35	1888
Mid. Atlan. States.						72.0	+ 4.6										1.48	— 2.6													
Albany	85	22	29.96	30.05	— .02	66.7	+ 3.8	97	23	78	38	15	56	34	58	71	1.80	— 1.8	7	4,896	s.	36	nw.	11	13	11	6	4.2	97	1895	33	1879
New York	314	25	29.73	30.06	— .03	69.7	+ 3.5	97	21	78	44	30	62	28	58	72	0.95	— 3.0	8	8,163	sw.	48	s.	18	19	8	3	3.4	100	1881	36	1872
Harrisburg	377	8	29.68	30.08	— .04	69.6	+ 5.2	94	21	79	42	15	60	31	57	71	2.18	— 2.3	10	3,943	w.	27	ne.	13	17	9	4	3.8	94	1895	36	1888
Philadelphia	117	25	29.95	30.07	— .03	72.4	+ 4.8	97	21	82	45	15	63	24	57	67	0.61	— 2.8	7	6,773	sw.	33	sw.	18	14	12	4	4.2	102	1881	40	1888
New Brunswick	.....	9	.....	.....	.....	69.8	+ 5.2	90	21	82	36	15	57	38	.....	.....	1.34	— 2.2	7	.....	w.	.....	.....	...	8	22	0	....	99	1895	36	1895
Baltimore	179	25	29.92	30.07	— .03	72.3	+ 4.1	96	21	81	46	30	63	25	60	69	6.01	+ 2.2	5	4,857	n.	32	n.	13	21	8	1	2.7	101	1881	39	1888
Washington	112	25	29.97	30.09	— .02	73.4	+ 5.0	98	23	83	45	30	62	32	60	73	1.11	— 2.9	5	3,860	s.	28	nw.	26	18	11	1	2.8	104	1881	38	1879
Cape Henry	.....	22	.....	.....	.....	75.6	+ 3.2	96	19	82	52	16	69	24	.....	.....	0.00	— 4.8	0	.....	s.	.....	.....	...	14	9	7	.....	96	*	49	*
Lynchburg	685	25	29.37	30.09	— .00	74.6	+ 5.7	99	19	86	46	30	63	37	59	67	0.56	— 3.3	1	2,565	se.	25	nw.	26	18	11	1	3.1	99	1895	35	1888
Norfolk	57	25	30.02	30.08	— .01	76.6	+ 5.4	100	23	85	54	16	68	27	64	73	0.19	— 4.7	3	5,001	se.	30	n.	29	23	7	0	2.1	100	1895	40	1888
S. Atlantic States.						77.3	+ 5.5										2.59	— 2.5													
Charlotte	773	17	29.28	30.08	— .01	76.2	+ 5.8	98	22	86	48	30	66	20	61	67	0.33	— 3.1	6	3,658	s.	20	s.	5	17	11	2	3.3	98	1895	38	1888
Hatteras	11	15	30.08	30.09	+ .02	76.6	+ 3.1	90	21	81	59	16	72	14	69	80	5.89	— 0.8	10	7,511	ne.	42	n.	30	14	10	6	4.1	90	*	50	1888
Kittyhawk	9	20	30.04	30.05	.00	76.6	+ 3.4	94	21	82	56	16	71	19	68	78	0.05	— 4.7	2	9,205	ne.	48	ne.	30	24	4	2	2.5	97	1888	39	1888
Raleigh	388	9	29.68	30.09	— .02	75.9	+ 5.7	98	*	86	50	30	66	28	62	70	0.38	— 3.3	5	3,194	sw.	26	n.	29	14	12	4	3.7	98	1895	39	1888
Wilmington	78	25	30.01	30.09	+ .02	76.6	+ 3.4	96	22	85	58	30	68	24	67	80	4.46	— 2.3	7	4,690	ne.	24	e.	2	22	6	2	2.5	96	1895	42	1887
Charleston	52	25	30.06	30.11	+ .05	78.4	+ 3.0	91	27	84	64	30	72	20	70	81	6.94	+ 0.8	8	5,509	ne.	28	ne.	14	15	10	5	3.6	95	1894	49	1887
Columbia	.....	9	.....	.....	.....	77.6	+ 3.8	96	24	89	54	30	66	31	.....	.....	1.47	— 2.6	5	.....	ne.	.....	.....	...	15	11	4	....	96	*	42	1888
Augusta	180	24	29.80	30.08	+ .03	77.8	+ 2.4	95	23	88	49	30	68	37	66	75	1.98	— 2.0	5	3,009	se.	33	ne.	8	20	6	4	3.0	98	1887	41	1888
Savannah	98	25	29.96	30.08	+ .02	78.2	+ 2.7	94	1	86	62	30	70	25	70	84	2.72	— 3.3	9	4,398	ne.	28	nw.	14	18	7	5	3.3	97	1890	48	1888
Jacksonville	43	24	30.01	30.06	+ .03	79.1	+ 1.4	94	14	87	64	17	71	22	71	83	4.66	— 3.3	9	4,491	ne.	34	w.	1	15	10	5	4.5	97	1876	55	*
Florida Peninsula.						80.2	+ 0.2										6.65	— 0.6													
Jupiter	28	8	29.99	30.02	+ .01	79.6	— 0.4	89	3	86	68	4	74	18	73	82	8.99	+ 0.2	22	6,509	ne.	30	ne.	15	5	16	9	6.0	91	1892	67	1888
Key West	22	25	29.99	30.01	+ .02	82.0	0.0	90	6	87	71	10	77	17	74	76	4.41	— 3.0	21	5,311	e.	31	ne.	16	4	23	3	5.8	97	1886	69	1893
Tampa	36	5	30.00	30.04	.....	80.2	+ 0.9	91	20	88	66	17	72	20	72	81	4.80	— 0.6	13	3,958	ne.	22	ne.	20	9	19	2	4.6	94	1893	65	1894
Titusville	44	9	30.01	30.05	+ .01	79.2	+ 0.2	90	14	85	70	18	73	17	73	84	8.41	+ 1.2	18	7,663	e.	46	e.	15	9	19	2	4.8	92	1887	58	1886
East Gulf States.						79.8	+ 3.8										1.13	— 3.5													
Atlanta	1,131	17	28.92	30.08	— .02	76.5	+ 5.0	92	19	85	45	30	68	21	64	73	0.21	— 3.8	3	5,021	nw.	32	nw.	29	20	8	2	2.6	95	1887	43	1888
Pensacola	56	16	29.96	30.04	+ .01	80.6	+ 3.1	93	10	88	57	30	73	21	71	76	1.41	— 4.2	10	5,293	ne.	28	n.	30	14	14	2	4.1	94	*	54	*
Mobile	57	25	30.00	30.06	+ .03	80.7	+ 3.8	93	10	89	54	30	72	21	71	79	1.68	— 3.4	9	4,592	n.	32	se.	15	10	17	3	4.2	96	1881	52	1888
Montgomery	221	24	29.82	30.05	.00	80.0	+ 4.5	96	14	90	50	30	70	31	66	70	0.74	— 2.4	5	3,516	ne.	25	nw.	4	19	9	2	3.0	99	1887	46	1888
Meridian	358	7	29.66	30.06	.00	77.8	+ 4.8	96	15	90	49	30	66	36	67	77	0.85	— 2.9	3	2,867	ne.	26	n.	29	11	19	0	4.3	96	1895	42	1889
Vicksburg	254	23	29.77	30.05	— .02	79.6	+ 3.9	95	15	89	44	30	70	27	68	76	0.14	— 3.9	2	3,557	n.	23	w.	1	27	3	0	1.6	98	1881	44	1895
New Orleans	54	25	29.99	30.05	+ .04	81.7	+ 3.5	94	1	88	57	30	73	18	70	74	1.97	— 3.0	11	4,616	se.	32	ne.	16	26	4	0	1.7	95	1893	56	1888
Port Eads	.....	9	.....	.....	.....	81.6	+ 1.8	91	5	86	66	30	77	15	72	72	2.06	— 4.1	14	.....	e.	.....	.....	...	3	28	4	4.9	.....	.....	.....	.....
West Gulf States.						79.4	+ 5.5										1.33	— 3.4													
Shreveport	249	25	29.78	30.04	— .00	79.2	+ 2.8	98	13	89	46	30	69	30	67	73	0.72	— 3.6	5	4,232	se.	33	ne.	29	20	4	6	3.9	101	1881	46	1895
Fort Smith	481	14	29.52	30.02	.00	76.2	+ 3.8	97	13	88	37	30	65	29	66	75	2.36	— 0.8	4	4,467	e.	26	s.	6	17	6	7	3.5	101	1893	37	1895
Little Rock	302	17	29.73	30.05	— .01	78.0	+ 4.6	96	11	88	45	30	68	28	65	72	0.41	— 3.0	4	4,001	sw.	33	n.	29	13	14	3	3.9	98	1895	42	1891
Corpus Christi	20	9	29.99	30.01	.00	79.9	+ 1.4	88	12	84	62	30	76	13	74	83	1.68	— 5.5	7	8,384	se.	36	n.	29	6	18	6	5.5	95	1893	55	1890
Galveston	42	25	30.00	30.04	+ .04	81.5	+ 2.8	90	7	85	60	30	78	15	71	74	1.86	— 5.2	15	7,056	se.	35	ne.	29	19	8	3	3.3	94	*	56	1890
Palestine	510	14	29.51	30.04	— .01	80.5	+ 5.1	100	12	91	48	30	70	30	67	72	1.05	— 2.4	5	4,338	se.	27	se.	21	10	16	4	4.6	100	*	47	1890
San Antonio	704	17	29.29	30.01	.00	80.8	+ 4.1	98	12	91	56	29	71	27	66	70	1.25	— 3.0	8	5,475	e.	32	n.	29	5	17	8	5.6	103	1893	46	1890
Ohio Val. & Tenn.						73.6	+ 3.2										2.07	— 1.0													
Chattanooga	702	17	29.31	30.10	+ .01	75.3	+ 4.1	93	19	85	47	30	65	31	65	77	1.00	— 3.4	5	3,464	w.	32	s.	16	17	11	2	3.8	96	1881	38	1888
Knoxville	980	25	28.98	30.10	.01	74.8	+ 4.9	93	23	86	42	30	64	32	63	74	0.59	— 2.5	4	2,675	sw.	22	nw.	16	18	8	4	2.9	97	1881	35	1888
Memphis	339	25	29.64	30.06	— .01	77.8	+ 5.4	96	15	87	45	30	69	30	65	73	0.73	— 2.7	7	5,564	s.	34	nw.	5	15	12	3	3.9	99	1887	44	1875
Nashville	545	25	29.51	30.08	+ .02	75.9	+ 5.5	94	20	86	44	30	65	34	62	70	6.69	+ 2.7	5	3,678	nw.	46	nw.	4	20	10	0	2.4	99	1887	38	1888
Lexington	989	11	29.03	30.06	.00	72.8	+ 5.1	95	20	83	38	30	62	31	56	62	0.38	— 2.1	6	7,391	sw.	34	sw.	18	15	5	10	4.7	95	1895	35	1888
Louisville	525	24	29.52	30.08	.00	74.0	+ 4.6	96	22	85	40	30	63	32	58	64	0.41	— 2.5	3	4,904	s.	36	sw.	4	17	11	2	3.7	99	1881	36	1888
Indianapolis	766	25	29.27	30.07	.00	70.8	+ 5.6	94	18	81	35	30	60	30	58	70	7.46	+ 4.6	5	3,981	sw.	24	w.	28	15	10	5	4.0	95	1894	34	1888
Cincinnati	628	25	29.41	30.07	.00	72.8	+ 4.6	95	18	82	41	30	63	28	54	57	0.49	— 1.9	4	4,998	se.	30	nw.	3	19	7	4	3.3	95	*	35	1888
Columbus	804	18	29.20	30.06	.00	71.2	+ 6.0	97	19	82	37	30	60	32	54	61	1.48	— 1.3	6	4,349	sw.	25	ne.	12	11	11	8	5.2	98	1881	32	1888
Pittsburg	843	25	29.18	30.06	— .02	71.0	+ 4.8	94	22	80	42	30	62	31	56	64	1.83	— 0.8	9	4,294	nw.	24	sw.	18	9	15	6	5.3	102	1881	35	*
Parkersburg	638	8	29.41	30.08	— .04	72.8	+ 7.0	96	*	85	42	30	62	36	58	65	1.76	— 1.4	4	3,550	se.	25	sw.	12	16	11	3	3.5	96	*	33	1888
Lower Lake Region.						66.4	+ 4.0										2.13	— 0.9													
Buffalo	690	25	29.29	30.02	— .03	64.8	+ 3.7	85	6	72	38	30	57	27	53	68	2.59	— 0.8	7	6,650	w.	48	w.	29	10	14	6	5.4	86	1884	35	1878
Oswego	335	25	29.65	30.01	— .05	63.8	+ 3.1	89	*	72	38	15	56	30	51	67	2.25	— 0.7	8	6,870	s.	38	s.	18	12	9	9	5.0	93	1881	36	1890
Rochester	535	24	29.48	30.04	— .01	65.2	+ 4.0	93	22	74	37	15	56	34	53	71	2.38	— 0.0	7	5,035	sw.	32	sw.	26	15	8	7	4.2	98	1881	34	*
Erie	714	23	29.29	30.04	— .02	65.8	+ 2.9	89	22	74	37	30	58	27	55	70	4.01	— 0.1	12	7,239	s.	45	sw.	12	10	11	9	5.4	92	*	36	1894
Cleveland	740	25	29.36	30.04	— .03	67.6	+ 4.7	92	20	75	42	30	60	29	56	70	1.68	— 2.2	10	8,854	se.	42	w.	26	14	6	10	5.0	98	1881	36	1887
Sandusky	629	19	29.37	30.03	— .03	68.8	+ 4.6	95	20	77	41	30	61	29	54	65	2.23	— 0.9	8	6,115	s.	34	nw.	26	11	8	11	5.3	96	1881	38	1893
Toledo	674	25	29.33	30.03	— .02	68.1	+ 4.9	93	11	77	37	30	59	28	54	68	1.11	— 1.4	7	6,833	sw.	30	nw.	23	16	7	7	4.1	95	1881	34	1893
Detroit	734	25	29.26	30.02	— .04	66.7	+ 4.3	94	11	75	36	30	58	28	53	69	1.15	— 1.4	6	7,533	sw.	36	w.	26	16	6	8	3.9	97	1874	30	1883
Upper Lake Region.						62.7	+ 4.2										3.26	— 0.3													
Alpena	609	24	29.31	29.96	— .05	61.0	+ 4.8	91	20	70	34	28	52	33	51	73	2.37	— 1.5	10	7,051	sw.	47	sw.	23	12	12	6	4.7	93	1894	28	1887
Grand Haven	638	25	29.31	29.98	— .05	64.7	+ 5.3	85	22	73	38	30	56	29	54	72	2.27	— 1.4	10	8,322	sw.	41	sw.	22	14	9	7	4.1	88	*	30	1889
Marquette	734	25	29.11	29.80	— .10	60.1	+ 4.7	93	10	69	37	29	51	43	50	75	3.52	— 0.9	17	9,174	nw.	52	se.	5	6	18	6	5.9	97	1874	28	1883
Port Huron	639	22	29.34	30.02	— .02	64.4	+ 4.2	94	11	74	34	30	55	25	53	74	3.68	+ 1.3	10	7,904	s.	36	w.	26	13	10	7	4.0	94	1895	31	1879
Sault Ste. Marie	642	8	29.25	29.94	— .07	57.1	+ 1.1	85	20	66	34	30	48	30	48	79	7.40	+ 2.9	17	6,437	se.	35	nw.	26	5	14	11	6.2	88	1892	30	1894
Chicago	894	25	29.14	30.00	— .04	68.6	+ 5.1	92	11	77	36	30	60	30	55	65	0.80	— 2.0	7	13,488	s.	53	s.	4	19	9	2	2.9	95	1893	35	1890
Milwaukee	673	25	29.27	29.96	— .06	65.6	+ 4.6	93	11	75	35	30	56	33	55	73	1.82	— 1.1	9	8,079	s.	42	sw.	22	15	9	6	4.1	94	*	34	*
Green Bay	617	10	29.29	29.95	— .09	65.4	+ 5.7	95	11	76	33	30	55	35	51	68	1.24	— 2.0	7	7,138	s.	40	sw.	22	6	14	10	6.2	95	1895	30	1893
Duluth	702	25	29.11	29.87	— .11	57.6	+ 2.2	85	20	66	36	30	50	32	48	75	5.96	+ 1.8	15	7,692	ne.	35	ne.	28	5	18	7	5.8	94	1894	30	1893
North Dakota.						56.9	+ 1.5										0.91	— 0.2													
Moorhead	936	15	28.86	29.87	— .00	58.3	+ 2.6	91	18	71	24	30	46	54	44	67	1.45	— 1.0	7	8,697	n.	44	n.	2	6	14	10	5.8	98	1894	17	1883
St. Vincent	794	16	29.00	29.86	— .08	53.6	— 0.2	88	2	67	22	30	40	46	42	77	1.90	— 0.9	9	6,388	nw.	36	nw.	25	9	11	10	5.4	100	1894	17	1883
Bismarck	1,681	21	28.12	29.89	— .06	59.2	+ 2.6	96	2	74	24	29	44	49	35	50	0.67	— 0.5	4	8,163	nw.	40	nw.	6	15	13	2	4.2	96	*	10	1876
Williston	1,875	17	27.89	29.86	— .09	56.4	— 0.5	95	2	70	17	29	42	53	30	46	0.32	— 0.6	7	8,464	nw.	52	w.	24	13	12	5	4.8	100	1892	17	1895
Upper Miss. Valley.						69.7	+ 5.5										3.03	— 0.4													
Minneapolis	.....	6	.....	.....	.....	66.1	+ 3.8	96	17	77	34	30	55	37	.....	.....	4.36	+ 2.1	9	.....	s.	....	.....	...	7	15	8	....	96	1895	32	1893
St. Paul	850	25	29.00	29.90	— .09	65.1	+ 5.4	96	17	75	33	30	55	37	51	68	4.75	+ 1.6	10	6,041	se.	35	se.	6	8	17	5	5.0	96	1895	30	1889
La Crosse	720	25	29.18	29.94	— .07	67.6	+ 7.2	97	11	78	35	30	57	42	55	72	2.41	— 2.2	8	6,157	s.	36	s.	22	10	13	7	5.2	97	1895	29	1888
Davenport	613	24	29.33	29.98	— .06	69.1	+ 4.9	92	*	79	34	30	60	34	57	73	4.30	+ 1.0	11	6,827	sw.	48	sw.	22	16	9	5	3.8	96	1893	33	1889
Des Moines	800	18	29.06	29.97	— .04	69.4	+ 6.0	94	17	80	32	30	59	33	55	69	3.30	— 0.3	6	7,307	sw.	37	sw.	22	16	9	5	3.3	95	1893	31	1889

TABLE I.—*Climatological data for Weather Bureau Stations, September*, 1895—Continued.

Stations.	Elevation above sea-level, feet.	Length of record, years	Pressure, in inches.			Temperature of the air, in degrees Fahrenheit.									Humidity and precipitation.					Wind.					Clear days.	Partly cloudy days.	Cloudy days.	Average cloudiness, tenths.	Monthly temperature data since opening station.			
			Mean pressure, 8 a. m. and 8 p. m. +2.	Mean reduced.	Departure from normal.	Mean max. and min. +2.	Departure from normal.	Maximum.	Date.	Mean maximum.	Minimum.	Date.	Mean minimum.	Greatest daily range.	Mean temperature of the dew-point.	Mean relative humidity, per cent.	Precipitation, in inches.	Departure from normal.	Days with .01, or more.	Total movement, miles.	Prevailing direction.	Maximum velocity. Miles per hour.	Maximum velocity. Direction.	Maximum velocity. Date.					Absolute maximum.	Year.	Absolute minimum.	Year.
Up. Miss. Val.—Con																															
Dubuque	.....	23	.....	.....	.....	69.8	+ 7.4	97	10	80	34	30	59	35	.....	.....	2.06	— 2.9	7	.....	s.	....	.....	...	21	4	5	....	97	1895	31	*
Keokuk	613	25	29.35	30.00	— .03	70.7	+ 5.3	95	17	81	36	30	60	37	57	68	2.67	— 1.0	7	6,243	sw.	42	w.	22	18	9	3	3.0	97	*	33	1889
Cairo	359	25	29.67	30.05	.00	74.5	+ 4.8	94	15	84	43	30	65	30	64	75	1.86	— 0.7	4	4,854	n.	32	n.	4	13	16	1	4.1	97	1881	42	1888
Springfield, Ill	644	17	29.37	30.04	— .02	70.6	+ 4.9	94	18	81	36	30	60	29	58	72	2.80	— 0.7	7	6,648	s.	31	s.	22	19	7	4	3.0	98	1893	36	*
Hannibal	534	....	29.45	30.01	.....	71.0	.....	94	*	81	36	30	61	35	59	73	2.69	.....	7	7,139	s.	41	s.	4	15	12	3	3.7	....	....	.....	.....
St. Louis	571	25	29.47	30.06	+ .01	74.1	+ 4.9	95	*	83	42	30	65	36	63	74	2.01	— 1.3	4	7,309	s.	41	nw.	22	16	9	5	3.4	102	1881	40	1873
Missouri Valley.						69.9	+ 4.8										2.02	— 0.7													
Columbia	.....	7	.....	.....	.....	73.1	+ 5.1	98	15	86	36	30	60	40	.....	.....	1.48	— 2.5	6	6,193	s.	39	sw.	22	16	10	4	3.8	104	1893	36	1895
Kansas City	968	8	29.00	30.00	— .02	73.2	+ 5.8	96	17	83	37	30	64	33	59	68	1.43	— 3.0	5	7,591	s.	36	sw.	22	18	10	2	2.7	101	1893	37	1895
Springfield, Mo	1,324	9	28.67	30.04	+ .01	71.4	+ 3.7	92	12	80	37	30	62	35	61	77	3.66	+ 0.1	9	6,963	se.	30	sw.	4	17	12	1	2.8	102	1893	37	1895
Topeka	.....	9	.....	.....	.....	73.1	+ 6.2	96	17	83	33	30	63	33	.....	.....	2.61	— 0.1	4	.....	s.	.....	.....	...	20	6	4	....	104	1893	33	*
Omaha	1,123	25	28.78	29.94	— .09	71.2	— 6.8	102	17	82	34	30	61	30	55	64	0.90	— 2.3	5	6,825	se.	36	s.	19	19	5	6	3.3	102	1895	30	1873
Sioux City	1,165	7	28.68	29.89	— .09	67.8	+ 3.1	103	17	79	27	30	56	43	52	66	3.91	+ 2.7	6	8,667	s.	48	sw.	5	13	10	7	4.4	103	1895	27	1895
Pierre	1,470	21	28.32	29.86	— .13	65.6	+ 3.4	101	9	80	30	29	51	44	54	58	0.36	— 0.7	3	7,100	nw.	52	w.	19	13	13	4	4.6	107	1874	18	1881
Huron	1,310	15	28.49	29.87	— .13	65.7	+ 4.6	103	17	79	32	30	48	45	44	60	1.84	+ 0.3	5	10,657	se.	61	se.	5	14	10	6	4.1	103	1895	18	1893
Northern Slope.						68.1	— 0.1										0.70	— 0.2													
Havre	2,477	16	27.28	29.87	— .09	52.6	— 2.0	91	1	65	18	22	40	47	34	56	1.05	— 0.2	10	7,396	nw.	48	nw.	2	7	17	6	5.3	93	*	18	1895
Miles City	2,374	18	27.41	29.87	.....	58.0	— 2.0	94	2	73	22	29	43	56	42	60	0.30	— 0.4	4	5,224	s.	38	nw.	27	15	10	5	4.3	99	*	22	1895
Helena	4,108	16	25.81	29.98	— .01	52.6	— 4.0	85	1	63	26	21	42	39	32	49	0.57	— 0.6	6	5,952	w.	38	w.	14	13	10	7	4.2	90	1893	26	*
Rapid City	3,260	10	26.57	29.89	— .08	62.2	+ 1.5	100	13	76	29	30	49	45	36	45	0.36	— 0.4	3	7,596	w.	48	s.	19	11	13	6	4.8	100	1895	25	1893
Cheyenne	6,105	25	24.05	29.92	— .05	59.6	+ 2.9	90	13	75	30	22	44	43	30	41	0.39	— 0.5	4	7,395	nw.	38	sw.	19	15	14	1	3.6	90	1895	30	1895
Lander	5,377	14	24.64	29.97	— .01	54.6	— 2.2	88	13	71	7	22	39	48	29	50	1.74	+ 1.5	3	3,480	sw.	44	w.	19	17	9	4	3.4	90	1882	7	1895
North Platte	2,826	21	27.04	29.93	— .07	67.4	+ 5.0	101	17	83	26	29	52	45	46	58	0.48	— 1.0	2	6,670	s.	30	n.	22	17	12	1	3.4	101	1895	21	1876
Middle Slope.						70.8	+ 5.1										0.56	— 1.0													
Denver	5,287	24	24.78	29.93	— .03	65.6	+ 4.2	96	13	81	27	22	50	42	32	38	0.98	+ 0.2	3	4,860	s.	32	nw.	1	21	9	0	2.6	96	1895	27	1895
Pueblo	4,734	8	25.28	29.93	.....	67.2	+ 3.5	96	16	85	28	23	50	48	32	36	0.03	— 1.3	1	4,877	nw.	44	n.	21	22	8	0	2.3	97	1889	28	1895
Concordia	1,410	11	28.49	29.94	— .10	75.4	+ 6.5	104	16	86	29	30	61	38	53	58	0.89	— 1.7	4	6,530	s.	34	s.	21	23	4	3	2.3	104	1895	29	1895
Dodge City	2,504	21	27.38	29.91	— .06	72.7	+ 5.3	100	5	86	30	29	59	36	49	53	0.06	— 1.1	1	10,818	s.	42	se.	21	23	6	1	2.3	100	1895	30	1895
Wichita	1,351	8	28.55	29.95	— .04	75.2	+ 6.2	100	12	87	34	30	64	35	57	62	0.86	— 0.9	3	7,439	s.	28	s.	19	25	3	2	2.0	104	1896	34	1895
Oklahoma	1,239	....	28.74	30.02	.....	76.1	.....	98	4	88	36	30	65	32	60	66	2.93	.....	5	6,795	s.	52	n.	6	24	3	3	2.1	101	*	36	1895
Southern Slope.						.....	.....										.....	.....													
Abilene	1,749	10	28.24	30.02	+ .01	76.8	+ 5.2	97	13	87	50	*	67	30	60	64	3.95	+ 1.1	7	6,513	sw.	30	nw.	22	9	14	7	4.6	104	1893	43	*
Amarillo	3,691	....	26.30	29.98	.....	70.2	.....	95	5	82	38	29	59	33	48	55	0.57	.....	5	13,480	s.	52	s.	21	15	6	9	4.0	....	.....	.....	....
Southern Plateau.						74.3	+ 1.9										0.12	— 0.7													
El Paso	3,767	18	26.20	29.93	.00	75.2	+ 1.8	96	11	87	43	30	64	34	51	52	0.28	— 1.0	7	7,242	e.	37	nw.	8	13	9	8	4.4	104	1879	42	*
Santa Fe	6,998	22	23.37	29.95	— .04	63.6	+ 3.9	84	12	75	33	22	52	29	32	38	0.09	— 1.3	3	4,540	se.	34	e.	26	22	7	1	2.5	90	1879	27	1880
Phœnix	1,106	....	28.68	29.80	.....	82.4	.....	107	12	97	47	22	68	43	53	42	0.10	— 0.4	1	2,980	e.	25	se.	17	24	5	1	2.3	....	.....	.....	.....
Yuma	141	20	29.63	29.77	— .04	84.2	0.0	107	7	100	58	30	68	44	51	40	T.	— 0.2	0	4,408	w.	28	n.	21	23	7	0	1.4	113	1879	50	*
Independence	3,884	....	25.97	29.83	.....	68.3	.....	92	8	84	34	22	52	42	23	22	T.	.....	0	6,296	nw.	46	n.	21	21	5	4	2.3	....	.....	.....	.....
Middle Plateau.						58.5	— 2.8										0.40	— 0.2													
Carson City	4,720	8	25.29	30.00	.....	54.8	— 5.4	85	27	72	18	22	38	48	25	34	0.16	— 0.4	2	.....	sw.	....	.....	...	26	1	3	2.1	80	1888	18	1895
Winnemucca	4,340	17	25.64	29.96	+ .01	57.0	— 2.8	86	29	73	16	22	41	49	20	29	0.09	— 0.2	4	7,175	w.	50	sw.	11	21	6	3	2.5	94	*	16	1895
Salt Lake City	4,345	22	25.63	29.95	— .01	63.8	— 0.1	90	16	76	29	22	52	37	37	43	0.95	+ 0.1	3	5,140	nw.	38	s.	10	16	7	7	4.3	93	1875	29	1895
Northern Plateau.						55.9	— 4.0										1.36	+ 0.8													
Baker City	3,430	7	26.44	29.96	+ .02	52.2	— 4.2	81	1	64	29	21	40	44	36	61	2.31	+ 1.6	9	3,352	s.	24	nw.	19	8	10	12	5.9	93	1893	28	1891
Idaho Falls	4,742	6	25.23	29.97	.....	55.6	— 0.7	86	1	72	19	22	40	47	34	53	0.45	— 0.4	4	6,604	s.	37	s.	5	14	9	7	4.2	88	1892	19	1895
Spokane	1,930	15	27.97	30.00	+ .02	53.8	— 4.1	89	1	64	30	21	44	35	36	58	1.34	+ 0.3	8	5,166	sw.	36	w.	19	5	11	14	6.6	98	1888	26	1880
Walla Walla	1,018	10	28.92	30.00	.00	58.3	— 7.0	83	1	68	36	21	48	34	44	60	2.13	+ 1.5	11	4,171	sw.	30	sw.	19	12	9	9	5.0	100	1888	36	*
N. Pac. Coast Reg.						55.2	— 2.5										2.36	— 0.5													
East Clallam	.....	....	.....	.....	.....	51.4	.....	67	28	58	32	*	45	25	.....	.....	2.57	.....	14	.....	sw.	....	.....	...	7	3	20	....	.....	.....	.....	.....
Fort Canby	179	13	29.87	30.07	+ .06	56.2	— 1.7	80	28	61	45	*	51	22	51	90	2.34	— 1.0	17	7,642	se.	46	se.	15	5	18	12	6.4	86	1883	42	1884
Neah Bay‡	....	11	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	72	1893	36	1887
Olympia	.....	19	.....	.....	.....	56.2	— 0.7	78	28	67	29	21	45	41	.....	.....	1.56	— 1.1	9	.....	sw.	....	.....	...	4	15	11	....	88	1894	31	1877
Port Angeles	29	11	29.98	30.01	+ .01	50.7	— 2.0	62	28	57	33	21	44	21	43	77	0.35	— 1.8	8	3,795	s.	32	w.	8	6	13	11	6.3	77	1888	32	*
Port Crescent	.....	.....	.....	.....	.....	49.1	.....	66	28	59	36	21	39	30	.....	.....	0.85	.....	7	.....	w.	....	.....	...	6	17	7	....	.....	.....	.....	.....
Pysht	.....	.....	.....	.....	.....	50.7	.....	65	1	58	32	21	44	21	.....	.....	1.48	.....	15	.....	w.	....	.....	...	5	5	20	....	.....	.....	.....	.....
Seattle	119	....	29.87	30.00	.....	55.8	.....	75	28	63	36	21	49	28	46	74	1.01	.....	9	3,832	s.	34	se.	11	10	6	14	6.1	....	.....	.....	.....
Tatoosh Island	86	12	29.91	30.01	+ .01	52.2	— 2.1	64	28	57	40	19	48	20	48	86	5.76	+ 0.9	21	8,228	e.	58	nw.	19	4	10	16	7.3	71	1889	30	1890
Astoria	.....	11	.....	.....	.....	56.2	— 3.7	76	28	63	40	21	50	22	.....	.....	2.65	— 1.7	18	.....	sw.	....	.....	...	11	7	12	....	87	1889	40	1895
Portland, Oreg	157	24	29.86	30.03	.00	57.4	— 4.1	79	30	66	36	21	49	29	46	70	1.16	— 0.6	12	5,671	nw.	34	w.	19	5	18	7	5.6	93	1886	36	1895
Roseburg	523	18	29.44	30.00	— .04	57.2	— 3.5	86	28	68	36	22	47	37	46	73	2.74	+ 2.0	10	2,221	nw.	17	w.	19	11	11	8	4.9	99	1888	35	*
Mid. Pac. C'st Reg.						61.1	— 2.2										1.73	+ 1.3													
Eureka	64	9	29.95	30.01	+ .01	58.7	— 0.7	70	27	60	36	22	47	28	50	68	3.14	+ 2.6	4	3,938	w.	34	nw.	21	10	15	5	4.5	77	1889	36	1895
Red Bluff	334	18	29.57	29.92	+ .01	68.5	— 4.7	97	26	81	48	23	56	36	46	51	1.76	+ 1.2	4	4,197	se.	30	se.	11	23	3	4	2.4	107	1891	46	1884
Sacramento	71	19	29.84	29.92	— .02	67.0	— 2.9	95	7	80	46	22	54	37	49	61	1.26	+ 1.0	4	6,221	sw.	36	nw.	21	25	1	4	1.9	106	1888	44	1893
San Francisco	153	25	29.80	29.96	+ .01	60.7	— 1.0	89	26	67	51	10	54	28	50	77	0.77	+ 0.6	4	8,290	w.	35	w.	27	17	6	7	4.0	94	1886	49	1894
Point Reyes Light	.....	6	.....	.....	.....	55.6	— 1.8	81	26	63	45	24	48	33	.....	.....	1.72	+ 0.9	4	.....	nw.	....	.....	...	12	4	14	....	.....	.....	.....	.....
S. Pac. Coast Reg.						62.9	— 2.2										0.03	— 0.1													
Fresno	332	9	29.54	29.89	+ .01	70.4	— 5.2	97	8	86	44	22	54	41	40	43	0.07	— 0.1	2	4,025	w.	26	w.	20	24	4	2	1.7	111	1888	44	1895
Los Angeles	330	19	29.55	29.90	— .01	68.8	— 0.9	97	25	83	48	22	55	41	51	68	T.	— 0.1	0	2,377	w.	14	nw.	12	12	17	1	3.1	108	1885	44	1880
San Diego	69	24	29.82	29.90	— .02	67.4	— 0.4	90	27	75	54	19	60	31	56	72	0.01	— 0.1	1	5,654	nw.	18	nw.	28	27	2	1	2.8	100	1878	50	*
San Luis Obispo	201	....	29.73	29.94	.....	64.6	.....	99	25	80	42	18	50	56	46	65	T.	.....	0	5,362	nw.	18	nw.	13	21	6	3	2.7	....	.....	.....	.....

NOTE.—The data at stations having no departures are not used in computing the district averages. Letters of the alphabet denote number of days missing from the record.

*Two or more directions, dates, or years. †Received too late to be considered in departures, etc. ‡Record incomplete.

TABLE II.—*Meteorological record of voluntary and other cooperating observers, September, 1895.*

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Alabama.	°	°	°	*Ins.*	*Ins.*
Alco	97	43	79.0	.....	
Ashville*†[1]	94	46	75.6	2.38	
Bermuda†	93	46	78.4	1.17	
Birmingham†	96[c]	42[a]	79.2[c]	1.27	
Brewton†	97	42	78.6	.....	
Carrollton*†	90	54	78.4	0.77	
Citronelle†	90	54	79.7	2.37	
Claiborne†	.....	.....	.....	0.08	
Clanton†	93	48	77.2	1.00	
Collirene*[1]	94	50	82.5	1.52	
Cordova†	.....	.....	.....	3.41	
Daphne†	94	41	77.6	2.38	
Decatur†	93	39	74.8	3.94	
Demopolis†	.....	.....	.....	0.39	
Elba†	.....	.....	.....	1.85	
Eufaula *a*†	95	54	81.2	1.41	
Eufaula *c*†	.....	.....	.....	0.25	
Evergreen†	95	50	80.0	2.52	
Florence *a*†	.....	.....	.....	3.23	
Florence *b*†	94	42	76.0	2.99	
Fort Deposit†	94	48	79.6	0.29	
Gadsden†	95	45	76.8	0.45	
Goodwater†	101	45	80.4	0.02	
Greensboro†	94	46	78.2	1.67	
Healing Springs†	97	45	78.1	0.20	
Highland Home†	95	49	79.3	0.28	
Jasper†	98	36	78.3	4.20	
Livingston†	98	44	80.2	0.76	
Lock No. 4	.....	.....	.....	1.17	
Madison Station†	92	40	75.2	4.73	
Maple Grove†	93	42	75.3	0.64	
Marion†	94	48	79.6	1.37	
Mount Willing†	95	46	78.9	1.30	
Newbern†	93	48	79.1	0.81	
Newburg†[d]	97	38	75.6	3.32	
Newton†	94	49	79.0	0.37	
Opelika†	95	46	79.9	0.84	
Oxanna*[1]	98	40	75.2	2.28	
Pine Apple†	95	42	78.2	0.92	
Pushmataha†	97	51	79.7	1.13	
Rock Mills†	91[c]	.....	78.2[c]	1.39	
Scottsboro†	92	40	74.4	2.51	
Selma†	.....	.....	.....	0.30	
Sturdevant†	.....	.....	.....	0.39	
Thomasville†[b]	93	59	80.4	1.32	
Tuscaloosa†	97	43	78.5	2.40	
Tuscumbia†	94	46	77.8	2.02	
Union†	97	48	78.2	1.09	
Union Springs†	94	46	79.1	1.81	
Uniontown†	97	48	80.8	1.27	
Valley Head†	94	34	75.6	1.07	
Wetumpka	.....	.....	.....	0.36	
Wilsonville†	.....	.....	.....	1.40	
Alaska.					
Coal Harbor†	69	32	47.3	2.03	
Killisnoo†	61	29	44.9	6.45	
Arizona.					
Benson*[3]	100	65	80.3	1.40	
Bisbee†	96	51	72.4	2.44	
Buckeye†	108	42	80.6	0.00	
Calabasas†	98	46	72.7	1.88	
Casa Grande*[3]	104	64	84.0	2.00	
Dragoon	.....	.....	.....	1.55	
Dragoon Summit*[3]	100	65	81.5	1.37	
Eagle Pass*[3]	.....	50	69.8	3.00	
Farleys Camp†	105	55	80.5	0.00	
Flagstaff	88	27	59.0	.....	
Fort Apache	91	32	65.2	1.68	
Fort Grant†	97	48	74.6	1.69	
Fort Huachuca	94	47	71.8	2.93	
Fort Mohave	114	53	85.3	T.	
Gila Bend*[3]	109	66	87.6	T.	
Gisela†	101	39	74.9	0.79	
Holbrook†	96	27	68.4	0.62	
Maricopa*[3]	115	60	85.8	1.10	
Mount Huachuca†	93	48	71.4	3.60	
Natural Bridge†	.....	.....	.....	1.18	
Navajo*†[3]	.....	47	67.1	0.75	
Oracle†	96	50	74.7	2.23	
Oro	.....	.....	.....	3.31	
Oro Bianco	97	56	78.6	1.33	
Pantano*[3]	103[c]	60	79.2	0.72	
Payson	.....	.....	.....	1.05	
Peoria†	105	58	82.8	0.00	
Reymert	106	.....	.....	1.21	
San Carlos†	107	50	78.6	1.94	
San Simon*[3]	102	57	80.7	0.55	
Show Low	.....	.....	.....	2.90	
Signal†	106	52	81.4	T.	
Sulphur Spring Valley†	.....	.....	.....	2.17	
Texas Hill*[3]	114	67	87.3	0.00	
Tucson *c*†	107	50	80.8	0.75	
Walnut Ranch*†[1]	86	48	69.2	1.93	
Wells	112	50	82.7	0.38	
Whipple Barracks†	94	28	66.3	0.00	
Wilgus†	.....	.....	.....	2.05	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Arizona—Cont'd.	°	°	°	*Ins.*	*Ins.*
Willcox*[3]	98	64	74.9	0.11	
Arkansas.					
Arkadelphia†	.....	.....	.....	1.95	
Arkansas City†	.....	.....	.....	1.35	
Bee Branch†	102	45	78.8	1.32	
Blanchard Springs†	99	38	77.6	0.74	
Brinkley†	98	40	77.3	2.75	
Camden *a*†	.....	.....	.....	3.09	
Camden *b*†	98	40	77.3	3.88	
Conway*[1]	91	43	76.6	*0.06	
Corning†	97	32	73.8	2.81	
Dallas†	95	37	76.4	1.85	
Dardanelle†	.....	.....	.....	0.75	
Elon†	99	40	79.0	0.26	
Fayetteville†	94	33	74.4	3.12	
Forrest†	95	39	77.2	2.85	
Fulton†	.....	.....	.....	0.92	
Gaines Landing	.....	.....	.....	1.62	
Helena *a*†	.....	.....	.....	0.85	
Helena *b*†	105	44	81.0	0.55	
Hot Springs *a*	100	44	79.2	0.66	
Hot Springs *b*	.....	.....	.....	0.87	
Hot Springs (near)	.....	.....	.....	0.62	
Keesees Ferry†	99	33	74.4	3.11	
Kirby†	95	.....	.....	1.60	
La Crosse†	96	42	75.2	1.10	
Lonoke*[1]	99	44	76.3	0.25	
Luna Landing*[3]	98	43	79.4	0.20	
Madding[2]	.....	.....	82.3	1.06	
Malvern†	100	40	77.9	0.84	
Mossville	91	.....	.....	1.38	
Mount Ida†	98	35	75.8	2.32	
Mount Nebo†	90	43	74.6	2.42	
New Gascony*[1]	95	44	78.0	1.02	
Newport *a*†	.....	.....	.....	1.70	
Newport *b*†	99	41	76.8	1.72	
Newport *c*†	98	39	75.6	1.00	
Osceola†	96	41	76.8	0.75	
Ozark†	98	45	78.7	2.25	
Pine Bluff†	101	44	80.2	2.07	
Pocahontas†	94	37	73.4	1.62	
Prescott†	98	44	78.6	0.54	
Rison†	98	37	78.0	1.15	
Russellville†	98	36	77.0	0.90	
Searcy†	95	39	73.0	0.06	
Stuttgart†	98	38	77.6	3.08	
Texarkana†	101	42	79.6	1.20	
Warren†	102	40	79.6	0.21	
Washington†	95	47	77.8	1.14	
Winslow†	88	34	72.0	0.93	
Witts Springs	91	33	71.8	0.71	
California.					
Adin	88	24	55.7	2.31	
Ager	90	32	61.3	0.58	
Agnew	92	38	60.9	0.07	
Arlington Heights	100	44	70.2	0.00	
Athlone*[3]	99	55	77.3	0.02	
Ballast Point L. H	.....	.....	.....	0.00	
Barstow*[1]	96	31	66.8	0.00	
Bear Valley†	.....	.....	.....	5.18	
Berkeley	87	50	61.5	1.28	
Bishop†	92[b]	36[b]	64.0[a]	0.01	
Bishop Creek*[3]	92	41	67.8	T.	
Boca*[3]	95	26	51.6	0.97	T.
Bodie†	78	6	46.7	0.50	T.
Bowmans Dam†	.....	.....	.....	10.12	
Borden*[3]	102	52	70.9	0.00	
Caliente*[3]	93	53	73.8	0.00	
Calloway Canal†	.....	.....	.....	0.00	
Cape Mendocino L. H	.....	.....	.....	1.80	
Cedarville†	86	22	56.8	1.23	
Centerville*[1]	100	51	66.5	0.75	
Chino*[3]	95	50	69.5	0.00	
Chico*[3]	98	50	68.8	3.15	
Cisco*[3]	75	29	51.7	.....	
Claremont	94	44	69.3	T.	
Cloverdale*[1]	100	49	69.5	2.64	
Corning*[3]	96	52	70.7	.....	
Coronado	84	58	67.5	0.01	
Crescent City†	83	38	55.9	3.16	
Crescent City L. H	.....	.....	.....	3.66	
Davisville *b*	99	41	69.4	0.98	
Delano*[3]	97	53	74.2	T.	
Delta*[3]	96	49	65.3	5.18	
Dry Creek*[3]	.....	49	63.1	.....	
Drytown	96	38	67.2	1.10	
Dunnigan*[3]	98	55	74.8	1.59	
Durham*[1]	88	50	63.7	3.33	
East Brother L. H	.....	.....	.....	0.50	
Edgwood*[3]	83	30	58.0	1.59	
Edmanton*[1]	85	30	52.8	9.35	
Escondido	96	46	71.0	T.	
Evergreen	.....	.....	.....	0.11	
Fall Brook*[1]	102	45	67.3	0.00	
Folsom City *b*[1]	94	48	67.7	1.43	
Fordyce Dam	.....	.....	.....	5.62	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fort Bragg†	87	37	58.5	3.40	
Fort Ross	.....	.....	.....	3.93	
Georgetown†	87	40	62.6	2.64	
Goshen*[3]	99	39	67.8	0.00	
Grass Valley	.....	.....	.....	3.87	
Greenville†	90	26	55.2	5.64	
Guinda	.....	.....	.....	0.74	
Hollister	96	38	63.5	0.06	
Hueneme	.....	.....	.....	0.00	
Humboldt L. H	.....	.....	.....	3.48	
Hydesville†	83	35	56.8	3.09	
Indio*[3]	114	62	88.1	0.00	
Iowa Hill*[1]	91	48	64.5	2.91	
Jackson	84	39	61.4	1.14	
Jolon	.....	.....	.....	0.03	
Julian†	95	42	67.2	0.00	
Keeler*[3]	98	49	75.1	T.	
Keene*[3]	93	40	65.6	0.00	
Kennedy Gold Mine	92	44	65.5	1.71	
Kernville	.....	.....	.....	0.00	
King City*[3]	100	48	64.0	0.05	
Kingsburg*[3]	95	50	71.5	0.00	
Lagrange*[5]	103	46	72.7	0.20	
La Porte*†[1]	78	33	49.8	8.42	
Lemoore *a*[3]	97	42	69.3	T.	
Lick Observatory†	83	35	59.0	0.08	
Lime Kiln	102	40	72.8	T.	
Lime Point L. H	.....	.....	.....	1.32	
Lodi	93	41	66.1	0.88	
Los Alamos†	.....	.....	.....	0.00	
Los Gatos *b*	94	40	62.4	0.24	
McMullin*[1]	104	44	70.8	.....	
Malakoff Mine*[1]	84	41	60.4	6.22	
Mammoth Tank*[3]	106	70	86.5	0.00	
Manzana	96	32	67.2	0.00	
Mare Island L. H	.....	.....	.....	1.21	
Merced*[3]	99	50	77.6	0.00	
Middletown*†[1]	102	44	64.0	1.86	
Mills College	.....	.....	.....	0.64	
Milton (near)*[1]	99	52	72.2	0.59	
Modesto*[3]	96	50	68.0	0.13	
Mohave*[3]	100	45	73.9	0.00	
Mokelumne Hill*[3]	.....	48	63.4	0.83	
Monterey*[3]	88	46	62.4	0.00	
Mount Frazier	.....	.....	.....	0.00	
Mount Glenwood*[1]	95	56	70.9	0.95	
Napa *b*	90	49	65.4	1.16	
Needles†	106	55	84.2	0.18	
Nevada City†	84	35	58.2	3.36	
Newcastle *a*†	90	43	65.2	2.00	
Newhall*[3]	101	48	69.6	0.00	
Nordhoff	103	31	68.3	.....	
North Berkeley*[1]	88	54	63.0	1.04	
Oakland *a*	86	49	61.6	1.07	
Ogilby*[3]	111	65	90.5	0.00	
Oleta*[1]	88	43	61.2	2.13	
Orangevale†	93	41	65.6	1.50	
Orland*[3]	99	54	71.0	1.67	
Ormonde†	.....	.....	.....	4.37	
Oroville *b*	94	50	72.0	4.25	
Palermo†	97	43	67.2	3.76	
Pasadena	95	47	69.2	T.	
Paso Robles *b*	91	53	63.7	0.00	
Petaluma*[1]	94	49	62.7	0.36	
Picacho	109	64	89.2	0.01	
Piedras Blancas L. H	.....	.....	.....	0.10	
Pigeon Point L. H	.....	.....	.....	0.18	
Pilot Creek	.....	.....	.....	2.84	
Placerville *b*	87	31	59.6	1.79	
Point Ano Nuevo L. H	.....	.....	.....	0.04	
Point Arena L. H	.....	.....	.....	2.31	
Point Bonita L. H	.....	.....	.....	1.22	
Point Conception L. H	.....	.....	.....	0.00	
Point Fermin L. H	.....	.....	.....	0.00	
Point George L. H	.....	.....	.....	3.95	
Point Hueneme L. H	.....	.....	.....	0.00	
Point Lobos	.....	.....	.....	0.88	
Point Loma L. H	.....	.....	.....	0.00	
Point Montara L. H	.....	.....	.....	0.50	
Point Pinos L. H	.....	.....	.....	0.14	
Point Reyes L. H	.....	.....	.....	1.72	
Point Sur L. H	.....	.....	.....	0.00	
Pomona (near)	99	44	71.4	0.00	
Portersville*[3]	98	44	78.9	T.	
Poway*[3]	96	55	63.0	0.00	
Quincy†	82	29	54.9	6.27	
Ravenna*[3]	95	49	67.7	0.00	
Redding *b*†	94	47	67.8	3.24	
Reedley (near)*[1]	98	48	73.4	.....	
Represa	88	42	65.8	1.45	
Rio Vista	95	39	64.9	1.18	
Riverside†	102	43	71.6	0.00	
Robertsons Mill	.....	.....	.....	0.00	
Roe Island L. H	.....	.....	.....	0.70	
Rosewood	96	36	64.9	0.81	
Sacramento	90	43	64.7	1.38	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
California—Cont'd.	°	°	°	*Ins.*	*Ins.*
Salton*§	117	70	91.4	0.00	
San Bernardino†	99	42	69.8	0.00	
San Jacinto†	98	38	69.0	0.00	
San Jose *b*	91	36	61.3	0.05	
San Leandro*‖	91	55	64.2	0.63	
San Luis L. H				0.00	
San Luis Obispo *a*				T.	
San Mateo*§	93	53	65.3		
San Miguel*§	97	45	67.5	0.00	
San Rafael	90	43	61.8	1.74	
Santa Ana*§	93	62	78.9	0.00	
Santa Barbara *a*	86	48	65.6	0.00	
Santa Barbara L. H				0.00	
Santa Clara *a*§	88	46	63.2	0.15	
Santa Clara *b*	100	42	64.5	0.13	
Santa Cruz *b*†	93	43	64.2	0.18	
Santa Cruz L. H				0.12	
Santa Monica*§	85	51	64.7	0.00	
Santa Rosa*§	94	50	65.3		
Saticoy				0.00	
Shasta				4.83	
Shasta Springs	85	30	58.2	5.10	
Skye Valley				0.02	
S. E. Farallone L. H				1.76	
Stanford University	92	43	62.9	0.11	
Stockton *a*	92	43	65.2	0.50	
Summerdale†				0.88	
Susanville†	86	30	59.1	3.00	
Sutter Creek*§	89	32	60.6	1.19	
Tecarte Dam*4	103	38	68.2	0.04	
Tehama*§	97	50	68.8	2.13	
Tejon Ranch				0.00	
Tempieton*§	96	38	64.4		
Trinidad L. H				3.81	
Truckee*§	82	30	51.6	1.32	
Tulare *b*				T.	
Tulare *c*	102	34	70.0	0.20	
Turlock *b*†	102	37	68.0	0.13	
Ukiah†	93	33	61.3	1.70	
Upper Mattole*‖	93	46	62.6	9.57	
Vacaville *a*‖	98	52	68.2	0.80	
Ventura†	88	48	63.2	T.	
Volcano Springs*§	115	70	91.6	0.00	
Walnut Creek	99	41	63.1	0.42	
Wenrich Ranch				0.00	
West Point				1.74	
Wheatland	91	44	65.4	2.63	
Williams*§	99	49	69.5	0.88	
Willows *b*§	95	55	71.5	1.21	
Wilmington*§	86	58	72.0	0.00	
Wire Bridge*5	91	44	66.4	1.81	
Yerba Buena L. H				0.82	
Yreka†	90	26	58.3	0.82	
Yuba City*§	90	50	71.4	2.79	
Colorado.					
Alma†	71	15	46.8	0.90	3.0
Antlers†	92	25	60.9	0.73	
Arkins				0.51	5.0
Boxelder				0.32	3.0
Breckenridge†	86	12	52.7	1.11	6.0
Brush‡	98	24	63.4		3.0
Byers*‖	99	28	57.2		1.0
Canyon†	95	28	65.8	0.14	1.5
Capps				0.15	
Castle Rock†	89	22	62.9	0.35	3.5
Climax†	67	8	45.6	1.05	6.0
Collbran				1.25	
Colorado Springs†	89	20	62.2	0.15	
Cope†	103	28	68.6	0.48	2.5
Craig				1.06	
Crook	104	22	70.2	0.60	
Deer Trail*§	96	37	66.0		2.0
Delta†	97	37	66.2	0.65	
Denver					11.4
Divide Exper. Station	88	19	59.4	0.27	3.0
Downing†	98	30	63.4	0.08	
Dumont*†				2.12	8.0
Durango†	85	29	61.0	0.92	
First View*§	94	38	68.0		
Fleming				0.55	4.0
Fort Collins†	95	23	61.0	0.47	4.0
Fox				0.23	2.0
Garnett				T.	
Glen Eyrie†	83	25	60.8	0.22	1.4
Gold Hill*‖	84	25	59.7	0.85	8.0
Grand Junction†	96	32	68.0	0.25	
Gulch	81	0	50.7	1.58	2.5
Gunnison†	86	17	53.0	0.28	T.
Holly				T.	
Holyoke *a*				1.39	2.0
Holyoke *b*				0.45	2.0
Hugo*§	95	38	67.0	0.95	1.0
Hugo (near)†	88	23	59.0	0.12	1.0
Husted	97	22	63.3	0.25	2.0
Jamestown	82‡	30‡	58.0‡	0.41	
Julesburg†	105	22	66.4	0.39	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Colorado—Cont'd.	°	°	°	*Ins.*	*Ins.*
Kit Carson*‖	100	30	71.0		T.
La Jara†	87	27	60.9	0.08	
Lake Moraine†	73	11	50.6	0.30	T.
Lamar†	104	27	69.8	0.00	
Laporte				0.66	6.0
Las Animas†	99	28	68.6	T.	
Lay*†	89	30	57.4	1.44	8.0
Leadville				0.78	3.0
Le Roy†	100	28	66.0	0.42	3.0
Livermore (near)				0.45	4.7
Longmont†	98	26	62.8	0.50	4.0
Longs Peak				1.10	6.5
Loveland				0.66	0.3
Manhattan				0.80	10.0
Meeker†	87	22	55.5	0.72	
Millbrook†	88	15	56.2	0.15	
Minneapolis†	102	27	70.6	T.	
Monte Vista	85	22	56.8	T.	
Moraine†	80	19	54.4	0.84	9.0
Ouray†	81	26	59.9	0.92	2.0
Pagoda	92	19	56.5	0.97	7.0
Parachute†	90	29	62.8	0.89	
Pinkhamton				0.41	2.0
Pueblo					0.2
Rangely†	94	22	60.2	1.30	
Redcliff				2.20	8.0
Rico				1.33	
River Bend*§	96	28	68.1		2.0
Rocky Ford†	100	28	68.0	T.	T.
Ruby†				1.32	8.5
Saguache†	80	24	56.6	0.32	T.
St. Cloud†				0.60	6.0
San Juan†	79	13	47.7	0.97	
San Luis†	97	30	60.2	0.28	
Santa Clara*†	81	27	55.8	0.12	
Selbert†				0.22	2.0
Smoky Hill Mine†	88	14	58.4	1.11	8.0
Snyder (near)				0.37	3.0
Stamford*‖	90	18	53.3	T.	
Sterling				0.20	2.0
Surface Creek†	82	23	59.9	1.27	
Thon†	102	21	64.8	0.06	3.0
T. S. Ranch†	90	25	60.2	1.00	0.5
Twin Lakes				0.90	
Vilas				0.01	
Wallet†				0.40	4.0
Watkins*‖	94	29	64.8		0.5
Yuma				0.55	3.0
Connecticut.					
Bridgeport	98	41	67.4	1.69	
Canton†	93	32	63.1	3.13	
Colchester	94	35	64.6	1.57	
Falls Village				2.24	
Greenfield Hill				2.44	
Hartford *b*				3.73	
Hartford *c*	91[4]	39[b]	64.4[c]		
Lake Konomoc				2.19	
Middletown	96	34	66.1	2.39	
North Franklin				3.01	
North Grosvenor Dale	88	34	61.8	3.40	
Norwalk	93	37	64.4	1.99	
Southington*‖	91	36	64.0	3.47	
South Manchester				2.42	
Storrs	93	35	63.2	2.97	
Thompson*‖	90	37	61.9		
Voluntown†	93	33	62.8	1.76	
Wallingford†				2.65	
Waterbury	93	41	65.3	2.16	
West Simsbury				2.68	
Windsor	90	36	63.9	4.11	
Delaware.					
Dover†	91	45	70.4	2.23	
Kirkwood‡			68.8		
Milford	99	41	73.7	2.96	
Millsboro	95	43	71.2	1.89	
Newark	97	39	70.4	0.88	
Seaford†	93	44	71.3	2.62	
Wilmington†	98	41	72.8	0.93	
District of Columbia.					
Distling Reservoir*§	92	45	71.8	1.27	
Receiving Reservoir*§	94	42	72.4	1.58	
West Washington	98	42	72.4	1.25	
Florida.					
Amelia†	90	61	79.0	1.77	
Archer†	95	62	80.2	4.36	
Avon Park†	95	70	81.3	3.88	
Bartow†	89	66	78.6	4.25	
Brooksville†	90	65	79.4	4.85	
Clermont†	93	66	80.1	2.40	
Earnestville†	94	63	80.4	3.73	
Eustis†	94	64	79.6	6.74	
Federal Point†	91	64	77.7	6.14	
Fort Meade†	91	63	78.3	2.01	
Frostproof*†	93	71	78.1	3.50	
Gainesville†	92	64	79.6	4.34	
Grasmere†	89	66	78.8	4.34	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Florida—Cont'd.	°	°	°	*Ins.*	*Ins.*
Green Cove Springs†	88	61	75.3	5.75	
Hypoluxo*†‖	90	73	80.0	9.13	
Kissimmee†	96	66	79.8	7.50	
Lake City†	92	64	80.2	1.14	
Lemon City*	95	74	82.3	3.50	
Manatee†	93[c]	62[c]	78.4[c]	6.23	
Merritts Island†	90	72	80.9	4.40	
Mullet Key†	90	74	80.9	2.19	
Myers†	91	71	80.4	7.79	
Oak Hill*‖	90	75	81.2		
Ocala*†	90	70	77.2	5.44	
Orange Lake	90	70	80.6	5.55	
Orange Park	90	61	78.0	4.56	
Orlando†	96	65	81.4	4.27	
Oxford†				6.12	
Plant City†	94	64	79.6	3.41	
St. Francis Barracks	88	67	77.6	3.20	
Tallahassee†	92	57	77.8	4.31	
Tarpon Springs†	89	66	78.7	5.98	
Georgia.					
Adairsville†	91	45	75.4	1.60	
Alapaha†	94	56	78.8	3.27	
Albany†	96	52	79.7	2.26	
Americus†	94	49	79.2	0.72	
Athens *a*	90	44	75.1	1.25	
Athens *b*†	93	39	75.3	1.14	
Bainbridge *a*†	95	56	79.7	2.64	
Bainbridge *b*†				2.53	
Blakely†	94	54	79.2	1.05	
Brag†	98	56	78.6	2.14	
Camak†	93	46	77.2	1.64	
Canton†				1.66	
Clayton†	89	36	68.2	0.22	
Columbus†	97	50	80.5	0.38	
Cordele†	92	52	78.2	1.02	
Covington	93	42	76.0	0.84	
Dahlonega†	91	45	69.6	0.93	
Diamond†	88	40	70.6	2.34	
Dublin *b*†				0.97	
Eastman†	98	50	79.0	0.76	
Elberton†	97	45	77.8	1.26	
Fleming†	97	52	77.8	2.66	
Forsyth*‖	98	54	80.5	1.19	
Fort Gaines†	94	48	79.0	0.46	
Gainesville†	86	40	72.8	1.27	
Gillsville†	95	45	76.0	1.31	
Griffin†	93	59	72.4	2.41	
Hawkinsville†	92	52	76.8	2.80	
Hephzibah*§	90	56	76.8	0.09	
Lagrange†	94	47	76.4	0.03	
Leverett†	94[c]	39[c]	76.8[c]	3.35	
Louisville†	100	47	78.2	0.86	
Macon *b*†	96	44	78.1	0.20	
Marietta†	89	43	74.0	0.53	
Marshallville†	92	49	80.0	1.30	
Milledgeville†	89	46	75.8	0.40	
Millen†	98	54	79.2	1.62	
Monticello*†	92[c]	52[c]	70.8[c]	1.90	
Morgan†	98	51	79.3	0.99	
Newnan†	93	38	76.9	1.13	
Point Peter*‖	92	40	75.5	2.85	
Poulan†	97	52	79.1	1.06	
Quitman†	91	58	77.6	2.09	
Ramsey†	94	36	75.2	0.87	
Resaca†				1.56	
Reynolds†				1.36	
Rome†	90	43	74.9	3.49	
Talbotton†	90	50	76.8	0.82	
Thomasville†	96	56	80.3	5.33	
Toccoa†	92	43	73.8	0.70	
Union Point†	92	45	76.3	1.10	
Washington†	90	45	76.4	1.37	
Way Cross†	92	58	78.4	2.18	
Waynesboro†	93	51	76.0	1.27	
West Point†‡	94	48	78.2	0.40	
Whitesburg†				1.11	
Idaho.					
American Falls†	89	23	57.2	0.52	2.0
Atlanta†				2.30	
Bannister†	75	18	45.0	0.42	
Birch Creek†	82	17	52.6	0.40	
Bliss†	91	22	55.5	0.92	
Boise Barracks†	91	29	56.7	0.32	
Carriboo†	82	16	54.8	1.90	2.0
Chesterfield†	85	8	49.0	0.31	T.
Cœur d'Alene	92	27	52.6		
Corral*†	82	21	51.1	1.72	
Dairy†	80	24	56.8	1.14	2.0
Fort Lemhi	82	22	52.2	1.00	0.5
Fort Sherman†	93	28	62.6	2.62	
Fraser†‡	82	25	50.4	2.94	
Gibbonsville†	86	19	50.8	1.31	
Grangeville	88	28	51.2	2.39	1.0
Hailey†	85	22	53.1	2.70	3.0
Idaho City†	96	24	55.8	0.78	
Idaho Falls					0.2

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Idaho—Cont'd.	°	°	°	*Ins.*	*Ins.*
Kootenai	78	28	49.2	2.64	
Lake	78	24	46.1	0.30	2.0
Lewiston†	94	29	58.5	1.39	
Lost River†				0.79	
Martin†	80	15	53.8	1.25	
Moscow†	84	28	48.4	3.33	
Murray†	90	25	47.8	4.31	T.
Nampa	87	24	56.8	0.61	
Oakley†	92	28	57.6	1.70	1.0
Paris†	91	18	55.6	1.13	4.0
Payette†	88	26	57.2	1.38	
St. Anthony	80	13	54.0	0.80	T.
Salubria†	89	26	56.4	2.21	
Soldier†	86	30	54.4	1.57	
Swan Valley†	88	14	54.7	0.94	2.0
Three Creek†	84	21	50.4	0.34	
Warren†	80	22	48.2	2.70	
Illinois.					
Albion†	93	36	71.9	2.95	
Alexander†	97	33	71.0	3.82	
Altamont				3.82	
Ashton*†[1]	91	32	66.4	1.22	
Atlanta				6.33	
Atwood				5.26	
Aurora†δ	94	29	67.8	1.17	
Beardstown†				3.15	
Bloomington†	95	30	70.0	4.28	
Bushnell†	96	35	73.0	6.50	
Cambridge	90	34	67.8	2.99	
Carlinville†	96	36	72.2	3.43	
				2.46	
Carlyle				3.97	
Carrollton	90	37	69.4	3.29	
Catlin†					
Cazenovia*[1]	94	22	67.5		
Chemung*[1]	93	26	67.4	4.74	
Chester†				3.38	
Cisne*†[1]	96	32	71.4	2.86	
Clear Creek†	97	28	68.8	1.46	
Coatsburg	96	28	69.2	2.29	
Cordova†				3.08	
Decatur†	93	39	71.0	4.47	
Dixon†	93	32	68.5	1.81	
Duquoin*[1]	98	40	75.6	1.45	
East Peoria†	92	34	68.6	6.19	
Effingham	94	34	77.4	1.10	
Evanston*[16]	94	40	70.0		
Fort Sheridan†	90	33	66.6	4.88	
Frederick				2.90	
Friend Grove*†[5]	96	40	74.6	2.62	
Galva†	91	30	67.4	5.17	
Gilman†				3.46	
Glenwood*†[1]	92	38	66.0	1.37	
Golconda	97	44	76.6	4.04	
Grafton†				2.78	
Greenville†	99	34	72.8	3.02	
Griggsville†	95	36	71.2	3.51	
Halliday*[5]	94°	44°	74.4°	2.91	
Havana†	93	38	71.3	4.34	
Herrins Prairie*[1]	96	42	74.9	2.00	
Hillsboro*†[1]	97	38	72.9	2.83	
Holts*[5]	102	49	72.8	2.25	
Iron	98	45	74.8	2.12	
Joliet†	98	31	71.8	0.93	
Jordans Grove†	95	36	71.3	2.65	
Kankakee α†	86	35	67.4	1.79	
Kankakee δ†[4]	91	31	72.2		
Knoxville*[5]	96	34	69.8	6.10	
Lagrange	90	33	67.0	1.10	
La Harpe*[1]	96	34	70.3	3.25	
Lanark*†[1]	93	35	66.7	1.70	
Lexington*†[1]	89	35	68.4	5.87	
Loami				3.50	
Louisville†	93	36	71.0	2.58	
McLeansboro*†[5]		40	69.4	3.00	
Martinsville†	93	33	69.8	2.48	
Mascoutah*[5]	101	42	73.7	1.90	
Monmouth†	94	34	68.0	4.26	
Morrisonville†	91[h]	40[h]	72.0[h]	3.25	
Mount Carmel†				2.96	
Mount Pulaski	94	33	71.4	3.75	
Mount Vernon	95	30	73.3	3.13	
New Burnside†	99	35	75.9	2.81	
Olney α[1]	95	36	73.4	2.06	
Olney δ[1]	96	36	69.4	2.01	
Oswego*[1]	91	34	66.0	0.59	
Ottawa†	96	30°	69.3°	1.47	
Palestine†	95	36	70.3	1.46	
Paris†	101	32	72.8	2.46	
Peoria α†				5.61	
Peoria δ	95	36	71.2	4.92	
Philo†	96	31	69.7	3.72	
Plum Hill*†[5]	98	36	69.4	2.49	
Rantoul*†[1]	92	35	65.8	5.42	
Reynolds	90	31	68.0	3.04	
Riley†	91	30	66.2	2.16	
Rockford†	94	30	71.2	2.77	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Illinois—Cont'd.	°	°	°	*Ins.*	*Ins.*
Rose Hill*[1]	97	40	72.8	3.51	
Rushville	100	36	72.9	3.44	
St. Charles[1]	99[p]	30	66.8	2.02	
St. John*†[1]	96	41	74.6	2.59	
Scales Mound†	97	28	68.5	1.10	
Streator	93	33	72.7	1.90	
Sycamore*†[1]	89	30	65.5	0.75	
Tampico	92	28	67.5	5.88	
Tiskilwa*[5]	91	30	66.0	4.44	
Tuscola*†[1]	94	28	69.2	4.63	
Walnut†	93	30	70.5	2.71	
Wheaton	92	34	69.2	1.82	
Winnebago†	91	29	66.8	2.29	
Zion†	95	32	67.2	2.07	
Indiana.					
Anderson†	92	30	69.7	2.27	
Angola*[1]	95	37	69.5	2.27	
Ashboro†	95	33	70.5	1.34	
Bedford	94	30	68.6	2.30	
Butlerville†	96	27	71.0	0.93	
Cambridge City†	92	32	67.7	2.65	
Columbia City*[1]	91	34	67.4	1.34	
Columbus†	92	30	69.1	2.00	
Connersville†	93	31	68.4	1.33	
Degonia Springs*[6]	93	39	72.0	2.62	
Delphi	94	32	69.3	2.81	
Edwardsville*†[1]	92	38	73.6	0.64	
Evansville†	98	30	73.6	2.41	
Farmland†	90	30	68.2	3.83	
Franklin*[1]	91°	35°	68.5°	3.31	
Hammond†	94	29	70.9	0.53	
Huntingburg†	96	35	70.8	2.85	
Huntington	94	30	68.8	1.49	
Jasper†	95	33	72.7	2.43	
Jeffersonville	93	37	72.7	0.53	
Kokomo†	93	34	69.7	2.44	
Laconia	91	35	72.2	T.	
Lafayette†	93	30	69.6	3.60	
Logansport α†				3.35	
Logansport δ	92	43	69.1	3.10	
Lyford†	96	32	70.9	3.53	
Madison†	95	35	72.7	0.78	
Marengo*[1]	94	32	71.0	2.15	
Marion†	95	34	70.5	2.46	
Mauzy†	91	30	68.9	2.02	
Mount Vernon†	100	39	74.7	1.95	
Princeton*†[1]	96	39	71.4	3.20	
Rockville†	94	32	70.4	4.66	
Scottsburg*[1]	94	34	70.1	1.57	
Seymour†	96	35	71.3	1.40	
South Bend†	94	40	69.8	1.22	
Sunman	92	32	69.1	0.55	
Terre Haute†	97	39	72.6	2.09	
Topeka†	94	35	70.7	1.42	
Valparaiso†	93	34	68.8	1.99	
Vevay	96	35	73.4	0.50	
Vincennes†	96	31	71.5	2.75	
Worthington†	93	34	70.5	2.16	
Indian Territory.					
Eufaula†				1.00	
Healdton†	104	38	80.2	0.10	
Kemp†	104	41	80.6	2.90	
Lehigh†	102	34	79.3	0.63	
Purcell†	100	38	78.8	0.05	
Tulsa†				1.90	
Vinita†	91	40	74.2	6.00	
Iowa.					
Afton	94	31	68.6	3.06	
Algona*[1]	94	30	65.1	3.82	
Alta†	98	30	65.7	7.43	
Amana†	93	30	68.0	2.71	
Ames δ	94	28	67.5	3.93	
Ames c				3.78	
Atlantic†	97	22	67.5	4.59	
Atlantic (near)	92	28	67.9	4.27	
Audubon	92	24	66.7	2.26	
Beiknap	101	32	70.8	1.91	
Belle Plaine	93	37	68.8	2.85	
Bonaparte†	96	32	70.9	3.07	
Carroll	95	34	65.2	1.73	
Cedar Falls†	94	31	67.5	3.98	
Cedar Rapids†	94	34	69.9	3.64	
Centerville	96	30	74.4	1.32	
Chariton	92	34	69.7	3.51	
Charles City†	92	25	66.0	2.05	
Clarinda†	94	27	68.3	0.95	
Clinton	93	31	68.6	3.40	
Corning†	95	26	69.2	1.00	
Cresco†	95	27	65.2	1.69	
Decorah†	97	30	67.1	3.20	
Delaware*[3]	94	32	65.4	3.55	
Denison†	96	25	66.7	1.78	
Elkader†	98	28	67.8	2.75	
Emmetsburg	98	24	64.4	5.47	
Estherville	101	27	67.4	4.72	
Fairfield†	91	29	67.5	2.06	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Iowa—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fayette	96	27	66.4	3.79	
Forest City	94	27	65.8	4.46	
Fort Madison*†[1]	91	39	71.1	3.97	
Galva†	96	28	66.3	3.92	
Garden Grove	93	27	67.4	2.95	
Glenwood†	103	36	74.2	1.33	
Grand Meadow*[1]	92	34	66.0	3.37	
Greenfield†	93	29	68.1	5.68	T.
Grundy Center	92	31	66.2	3.84	
Guthrie Center	98	34	66.9	5.01	
Hampton	98	28	64.8	2.15	
Hawkeye				3.83	
Hopeville†	93	31	68.8	3.61	
Humboldt†	96	25	67.3	2.08	
Independence†	93	27	66.2	4.30	
Indianola	96	28	69.1	2.17	
Iowa City†	96	31	68.6	3.43	
Iowa Falls†	93	23	64.1	3.39	
Jefferson	95	30	66.6	0.85	
Keosauqua†	100	34	71.3	3.27	
Knoxville	92	32	68.8	2.56	
Larrabee†	100	26	66.8	5.17	
Le Claire†				2.89	
Lenox*[1]	96	36	69.7	0.87	
Logan†	98	24	66.6	1.71	
Madrid	93	24	67.0	4.43	
Malvern				1.78	
Maple Valley				6.97	
Marshall†	96	29	67.7	2.77	
Mason City†	94	30	69.1°	3.29	
Maxon*[1]	96	38	70.8	2.09	
Mechanicsville	94	32	67.1	2.95	
Monticello*†[1]	94	28	63.6	2.59	
Mooar	97	35	70.4	2.10	
Mount Ayr†	93	32	69.0	1.19	
Mount Pleasant*[1]	90	36	70.2	1.33	
Mount Vernon*[1]	95	32	69.0	2.62	
Neola	102	27	68.8	1.16	
Newton†	93	30	68.6	4.82	
North McGregor†				2.37	
Ogden	95	23	67.8	2.75	
Osage*†[5]		33	62.7	4.98	
Osceola				3.17	
Oskaloosa†	93	26	68.8	4.09	
Ottumwa	96	32	70.3	2.36	
Ovid†	95	29	69.2	3.99	
Panama†	96	27	67.2	2.67	
Portsmouth	97	25	67.2	1.90	
Primghar	100	26	65.2	3.97	
Rock Rapids	104	27	65.1	3.80	
Sac City†	94	29	66.3	2.95	
Seymour†	96	30	71.1	3.05	
Sidney	101	35	72.3	1.29	
Spencer	99	25	65.2	5.85	
Spirit Lake†	101	27	68.2	5.50	
Toledo	94	29	68.2	2.59	
Villisca†	94	23	67.8	1.15	
Vinton*[1]	94	32	67.6	2.73	
Washington†	93	31	68.6	2.40	
Waterloo	94	29	66.7	4.01	
Waukee	92[d]	29[d]	67.3[d]	3.99	
West Bend*†[1]	95	28	63.6	4.14	
Williams	92	27	65.4	3.36	
Wilton Junction†	92	30	67.4	3.08	
Winterset	95	28	68.2	4.06	
Kansas.					
Abilene†	105	26	73.4	0.97	
Achilles*[5]	105[d]	31°	63.2°	2.58	T.
Altoona*†[5]	94	34	70.0	6.02	
Atchison	96	32	71.7	0.73	
Beloit†	102	28	71.1	0.84	
Blaine	102	32	72.0	1.33	
Burlington†	98	35	73.6	5.35	
Campbell	101	30	72.6	1.83	
Colby†	101	25	68.2	0.75	T.
Coldwater†	98	32	73.4	T.	
Collyer*[5]	105	31	73.8	T.	
Columbus†	91	32	71.7	10-12	
Coolidge†	100	31	69.9	0.00	
Cunningham†	101	25	74.3	0.16	
Downs				T.	
Dresden*†[1]	105	36	70.8	0.46	
Elk City*[b]	97	35	73.9	4.86	
Ellinwood*[5]	96	32	68.1	0.93	
Emporia†	90	33	71.6	8.25	
Englewood†	99	31	70.4	0.47	
Eureka†				5.79	
Eureka Ranch†	105	24	71.9	0.67	
Fort Riley†	100	32	74.6	3.80	
Fort Scott				3.41	
Frankfort	105	32	76.6	1.91	
Garden City†	100	22	71.8	0.35	
Garfield				0.50	
Gibson*[1]	105	27	70.6	0.35	
Girard*[1]	98	38	73.8	8.18	
Goodland	101	28	68.7	1.16	T.

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Kansas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Gove*†[1]	105	37	72.1	0.31	
Grainfield*[6]	112	30	75.7	0.00	
Grenola*[1]	97	35	72.5	1.60	
Grinnell*[5]	108	40	79.1	.....	
Halstead	.....	.....	.....	1.05	
Hays	104	20	70.9	0.26	
Horton†	96	35	71.2	2.51	
Hutchinson†	102	32	75.0	0.86	
Independence	98	34	75.0	6.04	
Ionia†	100	29	73.6	0.34	
Lawrence*[1]	94	36	71.2	5.91	
Lebo†	97	33	72.6	8.29	
Macksville†	101	29	73.8	0.85	
McPherson†	98	28	71.6	1.14	
Manhattan *b*	105	29	75.0	1.02	
Manhattan *c*[3]	103	27	69.9	1.38	
Marion	100	28	75.4	0.77	
Meade†	107	32	76.7	0.13	
Medicine Lodge	96	35	72.9	0.25	
Minneapolis†	104	29	73.8	0.99	
Morland†	107	24	70.6	0.60	
Morton†	96	28	71.8	0.00	
Mount Hope*[1]	98	39	75.5	0.51	
Ness City†	103	39	77.2	0.33	
New England Ranch†	102	28	70.2	0.00	
Norton†	98	27	69.8	0.50	
Norwich*†[1]	103	38	76.3	1.43	
Oberlin†	.....	.....	.....	1.35	T.
Olathe†	98	38	71.8	2.76	
Oswego†	98	32	74.2	5.55	
Ottawa†	95	29	73.3	1.52	
Paola†	95	30	75.4	1.35	
Phillipsburg†	110	28	72.8	0.58	
Pleasant Dale	104	27	73.4	T.	
Quinter*[1]	104	30	72.4	T.	
Rome*†[1]	99	33	74.8	0.30	
Russell	102	26	73.8	0.15	
Salina†	100	29	74.1	0.87	
Sedan†	97	39	75.5	1.65	
Sharon Springs*[1]	106	33	72.8	1.50	
Wakefield*[1]	108	35	75.4	2.13	
Wallace*[1]	102	26	72.9	1.08	T.
Wamego*[1]	100	30	73.2	1.38	
Wellington	.....	.....	.....	0.25	
Winfield*[5]	104	30	75.6	0.37	
Winona*[5]	106	38	77.3	0.50	
Yates Center†	92	31	71.2	7.76	
Kentucky.					
Alpha†	97	33	75.4	1.65	
Anchorage	95	37	71.8	0.45	
Blandville†	94	37	74.3	2.32	
Bowling Green *a*[1]	93	35	71.0	0.67	
Bowling Green *b*†	95	39	74.4	0.67	
Burnside†	.....	.....	.....	1.11	
Caddo†	100	34	75.8	0.03	
Canton*†[1]	97	40	75.4	2.23	
Carrollton†	101	32	73.5	0.57	
Catlettsburg†	.....	.....	.....	1.10	
Cromwell†	.....	.....	.....	T.	
Custer†	92	36	72.0	1.04	
Earlington	94	38	73.6	2.70	
Edmonton†	90	34	71.9	1.18	
Elizabethtown†	96	28	72.2	1.37	
Falmouth†	.....	.....	.....	0.49	
Fords Ferry†	98	38	75.9	1.97	
Frankfort†	96	31	73.0	T.	
Franklin*†[1]	97	45	76.5	1.08	
Georgetown	96	28	72.2	.....	
Greendale*[1]	94	38	73.3	0.57	
Greensburg*†[1]	94	35	71.7	0.25	
Harrods Creek†	96	37	74.2	0.40	
Henderson†	98	48	75.5	1.36	
Hendricks	.....	33	.....	0.50	
Lola†	95	29	73.4	2.07	
Louisa†	93	29	70.8	1.35	
Marrowbone†	95	32	73.2	2.41	
Mount Sterling†	92	34	69.7	3.18	
Paducah *a*†	.....	.....	.....	2.54	
Paducah *b*†	99	41	77.0	2.38	
Pleasure Ridge Park†	95	30	71.7	0.60	
Princeton†	98	27	72.5	0.00	
Russellville†	96	37	76.0	2.48	
Sandy Hook†	94	38	71.6	1.72	
Shelby City*[1]	96	37	73.4	0.50	
Shelbyville†	100	38	73.8	0.19	
South Fork†[2]	.....	.....	68.8	1.11	
Williamsburg†	.....	.....	.....	4.65	
Louisiana.					
Abbeville	94	46	79.8	2.55	
Alexandria†	95	44	78.3	2.30	
Amite†	97	46	80.7	1.49	
Ashwood	93	45	78.9	1.36	
Bastrop†	96	46	79.0	0.56	
Baton Rouge†	96	46	80.7	1.00	
Calhoun†	96	48	77.4	1.07	
Cameron	99	64	83.1	2.60	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Louisiana—Cont'd.	°	°	°	*Ins.*	*Ins.*
Cheneyville†	96	43	79.8	2.87	
Clinton†	96	46	79.8	0.94	
Coushatta *a*†	.....	.....	.....	1.50	
Coushatta *b*†	98	43	79.3	1.46	
Covington†	96	52	80.9	3.31	
Davis	94	37	76.4	1.16	
Delhi†	.....	.....	.....	0.09	
Donaldsonville†	96	49	81.0	1.08	
Elm Hall	97	41	79.4	2.02	
Emilie†	93	55	79.6	4.65	
Farmerville	96	44	77.6	2.76	
Franklin†	94	51	80.2	2.64	
Grand Coteau	94	50	80.0	2.18	
Hammond†	94	43	80.2	2.28	
Houma	95	53	80.6	1.34	
Jeanerette†	98	55[1]	81.4[a]	3.40	
Lafayette†	95	46	80.8	4.63	
Lake Charles†	96	49	80.7	1.34	
Lake Providence†	98	49	81.2	0.15	
Lawrence†	95	58	81.0	6.31	
Liberty Hill	102	46	80.8	3.55	
Maurepas	100	42	80.8	2.43	
Melville†	95	45	80.1	2.45	
Minden†	101	59	83.2	0.95	
Monroe†	95	46	79.9	1.36	
Natchitoches†	96	40	78.8	0.54	
Oak Ridge†[4]	100	50	82.0	0.80	
Oberlin	94	45	78.0	1.40	
Opelousas†	97	41	81.0	1.47	
Oxford†	97	58	77.0	2.60	
Paincourtville†	96	47	80.0	0.39	
Plain Dealing	95	46	79.0	1.91	
Rayne†	98	48	81.4	1.05	
Schriever†	98	49	81.0	1.25	
Shell Beach	92	50	80.2	2.65	
Southern University†	94	54	79.7	2.05	
Sugar Ex. Station†	98	52	80.4	2.93	
Sugartown†	93	50	80.2	1.48	
Thibodeaux	.....	.....	.....	0.84	
Toledo	99	.....	.....	0.45	
Wallace	94	54	79.9	3.49	
White Sulphur Springs†	96	38	78.0	0.87	
Maine.					
Bar Harbor	93	31	60.2	2.29	
Belfast*[6]	87	44	60.2	1.43	
Calais†	87	33	57.7	1.16	
Cornish*[1]	92	40	60.5	1.91	
Fairfield	91	32	59.3	1.11	
Farmington†	100	29	62.0	1.92	
Flagstaff†[4]	94	24	56.2	1.49	T.
Gardiner	95	35	61.5	1.21	
Houlton†	92	25	56.6	1.11	
Kineo†	.....	.....	.....	1.45	
Lewiston	96	39	62.2	1.15	
Mayfield	89	32	57.0	2.09	
North Bridgton	93	36	60.9	2.41	
Orono†	92	26	57.8	1.05	
Petit Menan*[1]	90	47	57.9	.....	
West Jonesport*[1]	78	34	56.2	.....	
Winslow	.....	.....	.....	1.56	
Maryland.					
Annapolis	95	49	73.0	.....	
Bachmans Valley*[1]	90	58	67.3	5.49	
Boettcherville*[1]	100	40	69.8	0.50	
Charlotte Hall†	100	44	73.8	.....	
Cherryfields†[2]	.....	.....	72.2	1.12	
College Park	101	44	72.4	1.81	
Cumberland *a*†	93	45	70.0	0.15	
Cumberland *b*	97	48	74.0	0.15	
Darlington†[4]	94	42	69.9	2.38	
Deer Park	90	27	64.2	.....	
Easton†	93	43	71.6	2.49	
Ellicott City	93	50	73.6	4.21	
Fallston*[1]	93	43	67.7	3.89	
Frederick *a*	96	42	70.4	4.87	
Grantsville	90	34	65.2	1.53	T.
Great Falls*[5]	92	38	71.4	1.74	
Green Spring Furnace	95	40	71.2	2.07	
Hancock	98	38	70.4	1.80	
Jewell†	95[5]	44[6]	72.5[4]	0.98	
Johns Hopkins Hospital	97	45	72.0	.....	
La Plata	97	58	73.5	0.50	
Laurel	93	42	69.4	2.70	
McDonogh	89	44	69.6	.....	
Mardela Springs†[1]	94[6]	44	72.1	2.35	
Oakland†	86	30	63.6	0.24	T.
Pocomoke City	96	46	73.6	3.17	
Princess Anne	96	39	71.6	0.92	
Sharpsburg	96	40	70.8	1.01	
Solomons†	98	50	75.6	0.76	
Sunnyside	91	29	63.8	0.47	T.
Upper Marlboro†	96	42	71.0	1.28	
Western Port	98	28	68.8	0.54	
Westminster	98	43	73.3	5.61	
Woodstock	92	40	68.6	5.54	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Massachusetts.	°	°	°	*Ins.*	*Ins.*
Adams	90	32	60.4	.....	
Amherst	90	33	62.4	4.64	
Amherst Ex. Station *b*	97	33	64.1	5.04	
Andover	94[a]	38[b]	66.2[f]	1.85	
Ashland	.....	.....	.....	2.41	
Bedford	91	33	62.7	2.25	
Beverly Farms	89	38	60.9	1.65	
Blue Hill (summit)	93	37	64.0	2.95	
Blue Hill (valley)	94	30	62.4	2.76	
Boston *a*	.....	.....	.....	1.06	
Brockton *a*	96	38	64.8	4.53	
Brockton *b*	.....	.....	.....	3.97	
Brockton *c*	.....	.....	.....	4.62	
Cambridge *a*	96	39	65.2	2.14	
Cambridge *b*	90	40	64.5	1.55	
Chestnut Hill	96	38	65.4	2.15	
Clinton	.....	.....	.....	1.10	
Cohasset	.....	.....	.....	2.02	
Concord†	96	34	62.9	2.73	
Dudley[1]	91[a]	36	66.4	1.30	
East Templeton*[1]	88	38	62.0	2.35	
Egg Rock, Nahant	88	40	62.6	.....	
Fall River	94	41	66.4	1.12	
Fiskdale	.....	.....	.....	2.70	
Fitchburg *a*[1]	90	41	61.7	2.70	
Fitchburg *b*	95	38	63.7	2.38	
Framingham	98	34	63.8	2.19	
Gilbertville†	.....	.....	.....	3.21	
Groton	92	35	62.0	3.17	
Hadley	95	30	62.8	3.98	
Hingham	.....	.....	.....	2.09	
Hobbs Brook	.....	.....	.....	2.19	
Hyannis*[1]	94	43	65.7	1.19	
Hyde Park*[6]	.....	40	63.9	.....	
Lake Cochituate	97	29	63.3	2.77	
Lawrence	94	39	64.2	1.98	
Leeds	90	34	61.2	3.27	
Leicester	81	41	65.2	1.48	
Leominster	.....	.....	.....	2.55	
Long Plain*[6]	93	38	64.4	1.40	
Lowell *a*	92	40	64.6	2.23	
Lowell *b*	94	37	62.8	.....	
Lowell *c*	98	39	66.0	.....	
Ludlow Center	90	33	61.3	3.75	
Lynn *a*	95	42	66.8	1.27	
Lynn *b*	92	41	65.9	.....	
Mansfield*[1]	92	32	62.9	3.53	
Middleboro	94	32	62.9	1.88	
Milton	88	36	62.0	2.35	
Monroe	86	29	57.6	3.22	
Monson	91	32	62.8	5.51	
Mount Nonotuck	.....	.....	.....	4.06	
Mount Wachusett	.....	.....	.....	2.98	
Mystic Lake	.....	.....	.....	2.23	
Mystic Station	.....	.....	.....	1.53	
Natick*[1]	86	42	63.3	2.32	
New Bedford *a*	89	38	64.6	1.50	
New Bedford *b*	93	37	64.7	2.96	
North Billerica	95	38	63.5	1.99	
Pittsfield	83	34	60.0	3.62	
Plymouth*[1]	91[a]	46[b]	65.0[c]	3.13	
Provincetown	88	42	64.4	.....	
Roberts Dam	.....	.....	.....	2.28	
Roxbury	91[a]	41[a]	64.6[c]	1.92	
Salem	.....	.....	.....	1.41	
Salisbury	.....	.....	.....	1.28	
Somerset*[1]	96	38	67.6	1.55	
Springfield Armory	93	32	63.9	3.11	
Taunton *b*	93	30	63.1	2.13	
Turners Falls	91	36	63.0	3.41	
Wakefield†	91	37	62.9	1.76	
Waltham	.....	.....	.....	2.55	
Webster	.....	.....	.....	3.62	
Westboro†	95	35	65.6	2.13	
Williamstown*[1]	87	38	61.7	2.22	
Winchendon	.....	.....	.....	3.43	
Winchester	.....	.....	.....	1.85	
Winthrop	93	38	64.4	2.09	
Worcester *b*	87	40	63.6	2.99	
Michigan.					
Adrian	100	32	67.6	1.58	
Allegan	93	36	67.7	1.41	
Alma	93	34	64.0	2.00	
Ann Arbor	92	37	66.1	0.94	
Arbela	.....	.....	.....	4.56	
Ball Mountain	92	30	63.8	1.58	
Battle Creek	93	33	66.4	1.29	
Benton Harbor	92	40	67.5	1.61	
Berlin*[1]	95	34	63.7	3.16	
Berrien Springs*[1]	94	34	68.4	0.15	
Birmingham	92	35	64.6	2.57	
Bois Blanc*[10]	92	38	63.4	.....	
Boon	92	29	59.6	3.59	T.
Calumet	83	33	56.5	10.36	T.
Charlevoix	89	38	62.3	9.70	
Cheboygan	93	30	60.1	4.91	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Michigan—Cont'd.	°	°	°	*Ins.*	*Ins.*
Clinton	97	32	67.6	0.56	
Crisps *10	87	35	58.2	.....	
Escanaba	89	40	66.5	8.73	
Fairview	94	37	66.6	0.16	
Fitchburg	94	31	64.9	1.26	
Flint	95	31	62.8	2.18	
Grand Point au Sable *10	86	43	63.8	.....	
Grand Rapids	92	37	67.2	2.07	
Grape	94	38	68.7	1.12	
Grayling	98	30	60.8	3.50	
Grindstone City *10	92	40	62.6	.....	
Hammonds Bay *10	94	42	64.6	.....	
Hanover	91	36	67.4	0.77	
Harbor Springs	90	34	61.3	4.42	
Harrisville	98	32	61.4	2.88	
Hart	.....	35	.....	2.15	
Hastings	90	35	65.6	1.76	
Hayes	96	38	67.4	2.60	
Hesperia	93	34	65.8	2.10	
Holland *10	84	43	66.8	.....	
Howell	96	31	65.8	0.81	
Ivan	95	32	62.4	3.52	0.2
Jeddo	93	32	63.0	5.06	
Kalamazoo	91[b]	38[b]	66.0[b]	2.81	
Lansing	92	34	64.7	0.86	T.
Lathrop *1	90[c]	31[b]	57.2[c]	.....	
Lewiston	97	31	62.2	5.05	
Madison	95	36	67.4	1.26	
Mayville	95	33	64.3	4.24	
Middle Island *10	86	36	61.4	.....	
Mottville	95	33	68.4	1.48	
Mount Pleasant	93	36	63.7	1.88	
Muskallongee Lake *10	85	36	57.6	.....	
North Manitou Island	80	39	63.0	.....	
North Marshall	92	30	64.5	0.86	
Northport	91[d]	38[d]	63.2[d]	4.07	
Old Mission	89	36	64.2	3.05	
Olivet	90	36	66.8	0.93	
Ottawa Point *10	98	36	66.6	.....	
Ovid	91	32	64.8	1.70	
Parkville	.....	.....	.....	1.00	
Point aux Barques *10	95	39	65.8	.....	
Pontiac	92	35	63.8	1.75	
Rockland	92[c]	31[c]	59.1[c]	3.45	
St. Ignace	87	32	58.8	5.53	
St. Johns	96	37	67.0	0.90	
Sand Beach *a*	94	36	63.6	3.43	
Sand Beach *b* *10	90	39	63.2	.....	
Saranac	94	36	65.9	2.52	
Sault Ste Marie	.....	.....	.....	.....	T.
Ship Canal *10	85	39	59.8	.....	
Somerset	94	35	66.9	0.68	
South Haven	90	39	66.4	1.06	
Standish	94	32	63.7	2.64	
Stanton	96	35	63.1	2.56	
Sturgeon Point *10	93	50	62.0	.....	
Thornville	94	35	65.8	3.11	
Three Rivers	.....	.....	.....	1.98	
Thunder Bay Island *10	83	38	60.8	.....	
Two Heart River *10	94	34	57.6	.....	
Vandalia	92	38	67.9	1.07	
Vermillion Point *10	80	32	52.9	.....	
Ypsilanti	94	30	64.5	0.82	
Minnesota.					
Ada	92	17	56.8	1.38	
Albert Leat	92	30	65.4	6.39	
Alexandria *a*	.....	.....	.....	1.98	
Beardsley	104	19	62.4	1.86	
Bellepiaine	.....	.....	.....	1.50	
Bingham Lake	97	32	64.0	7.10	
Bird Island	100	23	63.4	4.73	
Blooming Prairie	98	29	64.9	4.65	
Bonniwell	98	35	64.4	4.72	
Caledonia	96	30	65.0	3.14	
Cambridge	90	28	61.4	5.44	
Camden	102	25	63.0	3.80	
Carver[b]	.....	.....	59.2	4.74	
Clear Lake	92	28	61.0	4.17	
Clear Water *1	92	31	60.3	2.53	
Collegeville	96	33	64.2	4.08	
Crookston	82	24	56.7	1.25	
Dawson *1	108	22	61.0	2.81	
Farmington	96	30	63.2	5.71	
Fergus Falls	91	26	59.8	1.15	
Glencoe	101	14	61.6	.....	
Glenwood	97	27	61.2	1.85	
Grand Meadow	96	26	64.2	3.17	
Grand Portage	65	33	49.8	5.68	
Granite Falls	105	22	64.6	3.22	
Hutchinson	90	30	62.4	4.85	
Koochiching *4	85	24	54.1	1.19	
Lake Winnibigoshish *1	80	30	56.3	3.16	
Lawrence	93	29	60.4	4.62	
Leech Lake[b]	87[c]	24	55.7	3.47	
Long Prairie	90	29	58.3	3.92	
Luverne	99	28	64.0	3.61	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Minnesota—Cont'd.	°	°	°	*Ins.*	*Ins.*
Maple Plain	97	28	63.8	4.71	
Mazeppa[1]	95[c]	26	63.8	2.40	
Milan	105	21	63.4	2.23	
Minneapolis *a*	94	30	65.1	4.69	
Minneapolis *b* [6]	95[c]	27	62.9	4.23	
Minnesota City	96	33	67.0	3.55	
Montevideo	100	25	63.7	2.79	
Morris	96	25	60.8	1.75	
Mount Iron	85	27	54.2	5.28	
New London	102	25	65.2	2.55	
New Richland *1	94	30	66.0	.....	
New Ulm	99	29	65.3	5.80	
Park Rapids	87	22	56.4	2.30	T.
Pine River *1	89	29	57.9	4.39	
Pleasant Mounds	97	22	64.4	5.54	
Pokegama Falls[1]	89[c]	26	54.7	3.99	
Red Lake *2	89	33	56.2	1.81	
Redwing	.....	.....	.....	3.92	
Reeds Landing	.....	.....	.....	4.45	
Rolling Green	94	28	64.8	6.30	
Roseau	88	32	51.8	3.44	
St. Charles	97	29	64.3	3.79	
St. Cloud	94	30	60.7	3.84	
St. Olaf	91	28	59.2	1.08	
St. Peter	97	26	65.2	8.30	
Sandy Lake Dam[1]	85[c]	27	56.3	5.82	
Sauk Center	92	22	58.2	3.46	
Shakopee[6]	94[c]	32	65.4	4.35	
Sunrise City *6	92	24	61.2	.....	
Tower	84	32	56.0	3.97	
Two Harbors	80	32	57.9	8.63	
Wabasha *1	95	33	66.1	4.42	
Willmar	99	27	60.9[d]	3.92	
Winona	95	35	66.4	5.31	
Worthington	98	29	64.4	6.15	
Zumbrota *1	94	34	64.1	.....	
Mississippi.					
Aberdeen	98	40	80.2	0.80	
Agricultural College	94	46	78.1	2.06	
Batesville	95	40	76.6	1.05	
Bay St. Louis	92	57	81.6	1.71	
Biloxi	90	52	79.5	2.10	
Briers	92	46	77.6	1.97	
Brookhaven	100	42	81.1	0.60	
Canton	95	47	79.8	0.17	
Columbus *a*	.....	.....	.....	1.15	
Columbus *b*	101	42	81.0	0.94	
Corinth	96	42	71.3	1.23	
Crystal Springs	96	42	78.9	1.65	
Duck Hill	97	39	77.2	2.39	
Edwards	96	47	80.5	0.85	
Enterprise	95	40	77.8	1.00	
Fayette	96	41	79.2	1.47	
French Camps	97	33	75.8	0.07	
Fulton	96	39	78.2	2.00	
Greenville *a*	94	47	78.4	0.32	
Greenville *b*	98	45	77.7	0.37	
Hattiesburg	101	40	77.2	1.90	
Hazlehurst	98	43	81.0	0.35	
Hernando	96	41	78.2	1.08	
Holly Springs	94	41	77.0	1.58	
Itta Bena[4]	93	40	77.8	1.03	
Jackson	98	46	79.8	0.72	
Kosciusko	99	45	79.0	0.00	
Lake	95	46	77.8	0.92	
Leaf *1	98	54	80.6	.....	
Leakesville	97	46	81.0	2.15	
Leonia	101	45	81.6	0.67	
Logtown	93	54	80.4	2.08	
Louisville	98	44	78.5	1.25	
Macon	97	44	79.7	1.99	
Magnolia	.....	.....	.....	1.37	
Mayersville	96	47	80.6	0.30	
Moss Point	93	53	81.0	.....	
Natchez	96	48	80.0	0.42	
Okolona	100	40	78.8	0.67	
Pontotoc	98	40	79.0	2.03	
Port Gibson	98	38	78.9	1.15	
Stonington *1	92	48	79.0	.....	
Thornton	94	48	80.8	0.40	
Topton *5	94	52	81.0	0.85	
Vaiden	105	41	81.1	0.05	
Water Valley *1	100	42	76.2	3.30	
Waynesboro *a*	100	47	78.6	.....	
Waynesboro *b*	102	47	81.0	1.75	
Woodville	94	45	79.2	1.41	
Yazoo City	102	40	80.6	0.04	
Missouri.					
Akron	.....	.....	.....	1.31	
Appleton City	95	35	72.8	0.58	
Arthur *2	.....	33	68.6	2.09	
Bagnell	.....	.....	.....	0.50	
Bethany	96	28	72.0	0.26	
Birch Tree	93	34	70.8	2.04	
Bluffton *1	94[f]	42[f]	73.2[f]	5.71	
Boonville	.....	.....	.....	0.38	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Missouri—Cont'd.	°	°	°	*Ins.*	*Ins.*
Brunswick	94	35	71.6	2.06	
Carrollton	94	37	72.4	2.13	
Conception	94	37	70.7	0.47	
Cowgill *3	98	38	74.9	0.82	
Downing	.....	.....	.....	3.22	
East Lynne *3	.....	35	67.8	1.97	
Edgehill *5	90	36	71.0	3.50	
Eight Mile *1	92	32	69.5	1.89	
Eldon *1	100	34	73.4	0.74	
Elmira	100	34	71.8	0.58	
Emma *3	.....	34	73.2	1.95	
Fairport	.....	.....	.....	0.66	
Farmersville	.....	.....	.....	0.99	
Fayette	98	35	73.6	0.68	
Fulton	.....	.....	.....	4.45	
Gallatin *1	96	34	71.8	1.36	
Gayoso *3	.....	44	75.2	2.80	
Glasgow	98	29	72.6	0.78	
Gordonville *3	.....	39	70.6	2.65	
Gorin *2	102	35	68.4	3.25	
Grove Dale	102	25	72.9	1.47	
Half Way	93	28	72.0	1.80	
Harrisonville	100	35	74.1	1.80	
Hastain	96	28	73.6	0.83	
Hermann	.....	.....	.....	4.92	
Houston	96	30	70.8	3.12	
Houstonia (near)	.....	.....	.....	1.53	
Humansville	93	26	71.7	2.43	
Ironton *1	93	42	70.2	3.30	
Jefferson City	98	35	73.5	1.45	
Kidder	95	31	72.0	1.55	
Lamar	91	33	72.1	5.31	
Lamonte	.....	.....	.....	1.04	
Lebanon	93	31	72.6	1.37	
Lexington	95	34	72.2	0.86	
Liberty	98	34	74.8	0.41	
Louisiana Bridge	.....	.....	.....	3.14	
McCune *1	93	38	70.6	3.08	
Marble Hill	94	32	70.4	2.81	
Marceline	94	32	70.3	2.02	
Marshall	102	28	73.2	1.06	
Maryville *4	95	32	65.8	0.25	
Mexico	96	35	72.0	5.35	
Miami	.....	.....	.....	1.45	
Mine La Motte	92	34	71.0	4.21	
Mineral Springs	94	33	71.9	6.42	
Mount Vernon	95	27	71.4	4.21	
Neosho	.....	.....	.....	11.24	
Nevada	.....	.....	.....	4.36	
New Haven *1	95	46	74.5	2.96	
New Madrid	97	39	77.6	2.14	
New Palestine	.....	.....	.....	0.82	
Oakfield	93	37	72.1	3.30	
Oak Ridge *4	.....	40	75.8	3.05	
Olden	95	37	72.7	2.48	
Oregon *a*	98	33	73.2	0.32	
Oregon *b*	98	32	71.8	0.29	
Osceola	.....	.....	.....	1.14	
Oto	.....	.....	.....	8.80	
Palmyra *3	96	38	74.4	2.50	
Phillipsburg *1	93	32	70.7	2.24	
Pickering *4	102	28	70.2	0.38	
Pierce City *1	96	32	71.6	4.50	
Platte River *3	94	26	64.4	0.41	
Poplar Bluff	97	34	73.7	1.08	
Potosi	92	30	68.6	3.17	
Princeton *1	96	29	70.9	2.41	
St. Charles	97	35	72.9	2.17	
St. Joseph	.....	.....	.....	0.97	
St. Louis	94	30	70.8	2.01	
Sarcoxie *3	98	38	70.8	4.67	
Shelbina	.....	.....	.....	0.57	
Steffenville	.....	.....	.....	3.35	
Stellada	100	32	72.3	1.48	
Sublett	91	30	70.0	5.00	
Tindall	.....	.....	.....	1.60	
Trenton	.....	.....	.....	1.94	
Unionville	97	30	70.2	3.21	
Vermont *1	97	30	72.3	1.60	
Versailles	.....	.....	.....	0.66	
Vilas	.....	.....	.....	0.76	
Virgil City	.....	.....	.....	1.45	
Warrensburg *1	95	39	73.4	0.58	
Warrenton	93	35	71.8	4.98	
Wheatland	.....	.....	.....	1.35	
Willow Springs	104	36	74.4	5.42	
Zeitonia *1	101	41	70.2	1.82	
Montana.					
Big Timber	88	28	55.8	1.14	1.0
Billings	98	27	61.4	0.22	2.0
Boulder	86	21	50.2	0.81	
Bozeman	80	24	51.5	2.95	
Butte	80	21	49.0	1.19	0.2
Choteau	95[c]	20	51.8	0.75	
Cokedale	84	20	51.2	4.50	35.0
Columbia Falls	94	.....	.....	3.26	.....

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Montana—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fort Benton†	89	19	54.0	0.59	0.2
Fort Custer†	93	25	58.8	0.95	0.5
Fort Keogh†	96	19	56.8	0.56	.....
Fort Logan†	85	19	47.4	1.96	
Fort Missoula	89	25	51.2	1.04	
Glasgow†	94	15	53.6	0.44	
Glendive	98	23	58.6	0.10	
Grantsdale	89	10	44.5	0.84	
Great Falls†	89	30	56.4	0.02	T.
Hogan†	85	17	50.2	0.39	T.
Kipp	86	20	46.4	1.24	5.5
Libby†	96	30	52.5	1.80	
Manhattan†	82	21	50.5	2.05	
Martinsdale†	85	22	50.4	2.17	
Marysville†	82	30	48.9	0.97	T.
Miles City					T.
Pony	76	27	56.6	0.40	
Poplar	96	16	52.0	0.28	
Radersburg	95	34	63.6	1.75	
Sun River	85	16	52.1	0.45	
Toston	92	38	54.1	.....	T.
Troy†	86	27	51.0	2.46	
Utica†[b]	91	23	50.7	0.45	
Virginia City†	82	21	51.0	2.04	T.
White Sulphur Springs†	84	23	51.6	0.90	
Wibaux†	106	18	60.6	0.16	T.
Yale†	87	17	51.5	0.80	
Nebraska.					
Agee*[1]	103	33	68.0	1.98	
Alliance				0.16	2.5
Ansley†	102	24	66.4	2.78	
Arborville*[1]	105	27	70.9	1.35	
Arcadia				3.00	
Ashland *a*†	104	25	71.5	0.97	
Ashland *b*[1]	102	31	73.0	0.79	
Ashton	102	24	69.4	2.02	
Auburn*†	101	26	71.4	0.93	
Aurora*[1]	103	34	70.2	0.62	
Bassett	103	25	65.3	1.22	.....
Beatrice†	101	26	72.2	1.09	
Beaver City	102	27	72.0	1.00	
Benkelman*[1]	102	32	66.6	T.	T.
Blue Hill*[1]	101	34	70.2	0.70	
Bratton*[1]	99	32	72.0	1.01	
Brokenbow*[1]	106	30	68.2	1.89	
Burchard				1.40	
Burwell*[1]	100	38	71.1	2.02	
Callaway†	102	25	65.8	1.40	
Central City*[5]	99	40	74.8	1.56	
Chester*[1]	100	32	71.7	0.88	
Columbus†	99	28	68.4	3.13	
Cornlea				2.71	
Creighton	102	22	65.3	2.48	
Crete	100	28	71.6	0.79	
Culbertson				1.38	T.
Curtis *a*†	104	26	68.9	1.29	
Curtis *b*[1]	104	38	63.4	0.81	
David City*†	100	34	68.0	2.50	
Divide*[1]	104	38	70.3	2.42	
Dunning*[1]	102	35	69.5	0.89	T.
Edgar*[1]	102	34	73.6	1.10	
Elba				2.05	
Ericson*†[1]	103	40	75.6	2.24	
Ewing†				1.98	
Fairbury	103	38	73.3	0.94	
Fairmont*[1]	100	32	70.9	0.91	
Filley				0.51	
Fort Robinson	100	28	64.4	0.80	
Franklin†	106	24[c]	68.2[c]	0.45	
Geneva†	101	26	69.7	1.16	
Genoa†	103	32	68.8	2.11	
Gering†	100	20	63.2	0.27	2.5
Gibbon	98	30	70.2	0.95	
Gothenburg	106	29	67.4	1.35	
Grand Island*[1]	110	38	72.2	1.50	
Greeley				2.80	
Haigler*[1]	105	32	66.0	0.35	T.
Hartington†	99	28	65.6	4.77	
Harvard*[1]	100	29	69.3	0.75	
Hastings*[1]	97	32	66.2	0.78	
Hay Springs†	101	24	62.3	0.54	4.5
Hebron†	100	25	70.9	0.93	
Hickman*[1]	104	40	76.8	0.88	
Holdredge *a*				1.27	
Holdredge *b*	115	32	73.8	1.35	
Imperial *a*†	100	22	66.0	0.85	2.0
Imperial *b*				0.41	2.0
Indianola*[5]	105	27	69.8	3.20	
Kearney*[1]	99	38	74.0	1.77	
Kennedy†	104	28	64.7	0.89	6.0
Kimball†	95	20	62.0	0.20	2.0
Lexington†	102[c]	25[c]	63.4[c]	2.31	
Lincoln	101	28	72.2	0.64	
Lodgepole†	96[c]	20[c]	60.6[c]	0.95	
Loup*[1]	101	28	72.3	2.18	
Lynch*†[1]	105	22	64.9	3.04	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Nebraska—Cont'd.	°	°	°	*Ins.*	*Ins.*
Lyons	.....	.....	.....	4.85	
McCook*[1]	102	32	69.6	3.22	
McCool	.....	.....	.....	1.09	
Madison*[1]	103	23	64.8	2.14	
Madrid*†[5]	107	28	66.1	0.52	
Marquette*	103	30	.....	2.55	
Mason City	.....	.....	.....	3.00	
Minden*[1]	101	30	68.2	0.89	
Nebraska City *a*†[1]	95	27	67.6	1.10	
Nebraska City *b*[1]	98	32	71.3	0.95	
Nemaha City*[1]	100	29	72.7	0.80	
Nesbit†	103	30	71.9	0.72	T.
Norfolk†	106	33	73.4	1.84	
North Loup†	100	21	64.4	2.10	
North Platte	.....	.....	.....	.....	T.
Oakdale†	101	32	65.9	3.06	
Odell*[5]	98	32	73.7	1.31	
Omaha*[1]	100[d]	38	73.1[d]	0.74	
O'Neill*[1]	105	31	67.1	2.63	
Ord	102	28	69.7	3.17	
Osceola	.....	.....	.....	2.00	
Ough†	.....	.....	.....	0.25	2.0
Palmer *a*[1]	102	26	65.6	2.30	
Palmer *b*	.....	.....	.....	2.39	
Plattsmouth *a*†	.....	.....	.....	1.44	
Plattsmouth *b*[1]	102	35	75.4	1.44	
Potter*[1]	98	30	65.2	0.12	1.8
Ravenna *a*	104	29	69.0	2.62	
Ravenna *b*[1]	100	32	72.8	2.25	
Red Cloud *a*	.....	.....	.....	0.71	
Red Cloud *b*[1]	102	34	73.8	0.67	
Republican	103	30	71.0	0.50	
Rulo*[1]	100	33	72.9	0.39	
St. Paul	102	28	69.4	1.66	
Salem*[1]	98	28	74.0	.....	
Santee Agency†	106	25	68.6	3.47	
Schuyler	.....	.....	.....	3.07	
Seneca*[1]	104	28	63.4	0.25	0.5
Seward*[5]	101	40	72.2	1.22	
Spencer	.....	.....	.....	3.90	
Springfield*[1]	103	27	71.6	0.70	
Springview	108	24	65.2	1.18	
Stanton*[1]	102	28	66.8	2.55	
State Farm	105	32	74.2	0.63	
Strang*[1]	102	40	75.4	0.94	
Superior*[5]	100	30	72.4	0.56	
Sutton	98	28	67.2	1.72	
Syracuse	.....	.....	.....	0.82	
Tecumseh *a*†	99	23	71.2	0.98	
Tecumseh *b*†	.....	.....	.....	0.49	
Tekamah	104	27	69.4	2.20	
Thedford*[1]	105	30	64.2	0.65	
Turlington†	102	27	71.4	0.85	
Wakefield	.....	.....	.....	3.24	
Weeping Water*[1]	100	20	69.2	0.79	
Weston*[5]	104	32	76.2	0.95	
Whitman	.....	.....	.....	0.10	T.
Wilber*[1]	100	30	72.7	0.83	
Wilcox	.....	.....	.....	1.12	
Wilsonville*[1]	103	24	67.9	1.25	
Woodlawn	.....	.....	.....	0.55	
Nevada.					
Austin	79	22	57.1	T.	T.
Battle Mountain*[1]	88	30	58.5	0.10	
Belmont	79	18	56.4	0.06	T.
Beowawe*[1]	90	22	60.9	T.	T.
Candelaria	95	26	65.4	T.	
Carlin*[1]	93	0	50.4	T.	T.
Carson City	87	17	55.2	0.20	
Cloverdale	.....	.....	.....	T.	T.
Clover Valley†	.....	.....	.....	0.21	1.0
Cortez†	.....	.....	.....	0.29	1.0
Cranes Ranch	.....	.....	.....	0.12	
Darrough Ranch	.....	.....	.....	T.	
Downeyville	95	36	67.9	T.	
Elko*[5]	88	19	57.5	0.10	
Elko (near)	88	10	55.0	0.95	0.5
Ely	85	15	55.3	0.35	3.0
Empire Ranch†	100	10	66.2	T.	T.
Fenelon*[1]	93	22	55.0	0.32	1.5
Genoa	85	22	60.3	0.75	
Golconda*[1]	92	38	58.7	0.02	
Halleck*[1]	80	12	50.7	0.05	T.
Hamilton	98[b]	10	58.6*	0.23	0.8
Hawthorne *a*[5]	90	37	67.2	0.00	
Hawthorne *b*	92	28	62.2	0.00	
Hot Springs*[1]	90	32	62.5	T.	T.
Humboldt*[1]	88	27	56.0	T.	
Las Vegas	95	41	69.6	0.00	
Lewers Ranch	86	21	57.6	1.95	
Lovelock*[1]	98	43	70.2	T.	
Mill City*[1]	88	28	56.8	.....	
Osceola†	86	21	63.4	0.42	4.0
Palisade*[1]	87	34	70.0	0.25	T.
Palmetto	85	18	57.2	0.10	
Reno*[5]	88	30	58.5	0.50	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Nevada—Cont'd.	°	°	°	*Ins.*	*Ins.*
Reno State University	87	24	57.0	0.24	
Reese River	.....	.....	.....	0.06	0.6
Ruby Valley†	.....	.....	.....	0.07	T.
St. Clair	85	23	58.2	0.00	
St. Thomas	106	37	78.2	T.	
San Antonio	90	19	60.0	T.	
Silver Peak	95	26	67.0	0.00	
Stofiel	84	14	52.2	0.41	0.5
Sunnyside	92	20	60.2	0.00	
Tecoma*[1]	90	34	64.3	T.	
Toano*[1]	86	18	58.6	0.17	1.0
Tybo	84	21	60.4	T.	
Verdi*[1]	85	28	54.5	1.97	
Wadsworth*[1]	88	27	58.5	0.05	
Wells	85	15	56.1	0.32	1.5
Winnemucca	.....	.....	.....	.....	T.
Yerington	86	11	56.9	0.00	
New Hampshire.					
Alstead*[6]	84	34	60.8	3.66	
Belmont	.....	.....	.....	3.41	
Berlin Mills	89	26	57.2	2.19	
Bethlehem	87	32	58.1	3.23	
Brookline*[1]	94	41	62.4	3.12	
Concord	91	27	60.5	2.34	
Dublin	90	35	61.8	4.20	
Durham	95	30	61.9	2.01	
Grafton	95	34	59.6	2.80	
Hanover	87	30	60.8	2.56	
Keene	93	27	59.2	2.80	
Lakeport	.....	.....	.....	3.70	
Mine Falls	.....	.....	.....	2.55	
Nashua	95	33	63.2	2.46	
Newton	93	33	61.5	2.61	
North Conway	96	30	62.2	2.25	
Pennichuck Station	.....	.....	.....	2.33	
Peterboro	93	28	60.6	2.99	
Plymouth	92	29	58.4	3.53	
Sanbornton†	89	34	59.3	3.33	
Stratford	96	28	60.5	2.19	
Warner	.....	.....	.....	4.33	
Weirs Bridge	.....	.....	.....	3.35	
West Milan	90	26	55.4	1.97	
Wolfboro	.....	.....	.....	3.81	
New Jersey.					
Allaire	97	36	68.8	.....	
Asbury Park	99	45	69.0	2.13	
Barnegat	101	41	70.8	0.58	
Bayonne	100	43	71.6	1.35	
Beachhaven	97	47	70.8	0.76	
Belvidere	98	32	68.7	0.76	
Beverly†	103	39	72.3	0.48	
Billingsport	94	46	70.5	0.89	
Blairstown	99	40	70.8	0.92	
Boonton	96	39	69.6	0.98	
Bridgeton	96	45	72.6	1.25	
Camden	95	43	70.2	0.89	
Cape May	95	45	72.4	0.49	
Cape May C. H.†	96	40	70.6	0.73	
Charlotteburg	95	30	63.6	1.06	
Chester	90	35	64.6	1.06	
Deckertown	97	31	67.4	1.18	
Dover	99	30	66.8	0.64	
Egg Harbor City	100	37	69.8	1.01	
Elizabeth†	98	41	69.6	0.83	
Englewood	96	33	67.1	1.10	
Franklin Furnace	95	29	65.8	1.98	
Freehold	96	36	68.6	1.44	
Friesburg	.....	.....	.....	0.67	
Gillette	95	33	66.1	0.95	
Hammonton	.....	.....	.....	0.46	
Hanover	94	35	66.8	1.17	
Hightstown	97	38	69.8	0.84	
Imlaystown	98	38	71.5	1.47	
Junction	.....	.....	.....	0.63	
Lambertville	96	36	69.9	1.17	
Millville	103	40	73.0	1.06	
Moorestown	101	38	72.4	0.47	
Newark *a*	96	44	69.6	0.64	
Newark *b*	98	43	70.2	0.64	T.
New Brunswick *a*	103	38	71.6	1.23	
New Brunswick *b*	97	38	68.3	1.36	
Newton	94	36	65.3	0.91	
Ocean City	94	40	70.9	2.00	
Oceanic	97	49	72.5	2.23	
Paterson	97	41	69.6	0.97	
Perth Amboy	100	40	71.4	0.65	T
Plainfield	102	40	70.8	0.79	
Rancocas*	99	42	.....	0.22	
Readington*[1]	102	42	73.2	.....	
River Vale	98	30	66.6	1.16	
Somerville	109	39	72.6	0.70	
South Orange	95	44	68.2	0.97	
Toms River	103	36	70.5	2.71	
Trenton	97	45	78.2	0.86	
Vineland	101	37	72.0	1.65	
West Summit*	95	45	68.0	.....	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
New Jersey—Cont'd.	°	°	°	*Ins.*	*Ins.*
Whiting	103	38	72.0	2.36	
Woodbine	98	35	68.8	1.24	
New Mexico.					
Albert†	94	38	69.9	0.00	
Albuquerque†	89	40	71.2	0.18	
Alma†	92	33	67.6	3.27	
Aztec†	95	38	66.6	0.13	
Bernalillo†	94	39	69.8	0.02	
Chama	94	19	61.4	0.45	
Deming*‡	100	42	77.6	0.00	
Downs Ranch	94	44	69.8	4.20	
East Las Vegas†	88	33	62.0	T.	
Eddy†	98	45	76.6	0.31	
Engle†	95	36	70.5	0.25	
Espanola†	96	35	67.0	0.36	
Fort Bayard	91	40	68.2	0.85	
Fort Stanton†	91	35	63.2	0.65	T.
Fort Wingate	94	28	66.2	0.19	
Gallisteo†	94	42	68.8	0.01	
Gallinas Spring†	92	35	67.4	0.11	
Gila	98	45	73.4	1.10	
Las Cruces	96	35	70.1	0.96	
Lordsburg*‡	98	50	74.5	0.84	
Los Lunas†	92	32	67.4	T.	
Lower Penasco†	90	34	65.5	1.98	
Monero†	86	16	57.6	0.22	
Ocate†	84	29	59.6	0.45	
Olio			63.6	T	
Pecos				0.20	
Puerto de Luna†	94	40	70.9	0.10	
Raton†	92	27	63.6	0.00	
Rincon†	95	38	71.4	1.33	
Roswell	101	39	72.6	1.09	
San Marcial†	88	29	64.8	0.32	
Springer	97	28	65.2	0.00	
Taos†	95	29	64.0	0.36	
New York.					
Addison	92	31	63.5	1.22	
Akron				3.17	
Alfred	91	32¹	64.3°	0.95	T.
Angelica†	88	25	60.6	1.92	T.
Appleton	91	34	63.6	3.53	
Arcade	88	29	61.4	1.61	T.
Atlanta				1.33	
Avon	91	32	64.8	1.81	
Baldwinsville	93	37	64.0	2.62	
Bedford	96	35	65.7	1.98	
Big Sandy*‡	87	39	64.6		
Binghamton†	92	27	63.9	2.11	
Bloomville	89	29	59.2	2.42	
Bolivar				1.98	
Boyds Corners				1.06	
Brentwood	96	33	65.4	1.40	
Brookfield	92	32	64.0	1.92	
Brooklyn	98	46	70.4	1.37	
Canton	89	28	59.6	5.03	
Carmel	94	38	65.8	0.81	
Charlotte*‡	88	38	61.8		
Cherry Creek				2.10	
Cooperstown†	86	31	60.7	2.86	
Cortland	90	27	61.0	2.36	
De Kalb Junction				4.50	
Demster				2.67	
Deposit				2.30	
Eagle Mills				2.18	
Elmira*†‡	93	43	66.5	1.89	
Fleming	90	36	65.4	1.87	
Fort Niagara†	94	40	65.5	2.78	
Friendship	90	34	61.2	3.02	T.
Fulton				2.13	
Glens Falls	94	32	61.5	2.18	
Gloversville	91	31	60.5	1.90	
Hamilton	91	35	61.6	2.07	
Haskinville				2.19	
Honeymead Brook	92	35	64.1	2.87	
Humphrey	89	33	62.2	1.90	0.6
Ithaca	91	32	65.0	2.03	
Kings Station				2.27	
Lebanon Springs	88	27	60.9	2.83	
Le Roy	96	33	61.8	1.90	
Lowville	89	27	59.8	2.63	
Lyons	92	37	64.7	1.67	
Madison Barracks†	91	30	62.2	2.07	
Malone	88	31	59.6	3.31	
Manhattan Beach†	88	45	65.7	1.03	
Massena	89	32	58.6	3.55	
Minnewaska	89	39	64.0	0.98	
Mount Morris	91	31	64.2	1.84	T.
Newark Valley				2.13	
New Lisbon	90	24	59.0	2.16	
North Hammond†	90	36	63.6	2.70	
Number Four†	84	28	56.0	6.42	T.
Ogdensburg	87	35	62.9	3.25	
Oneonta	93	30	63.3	2.62	
Oxford	90	28	61.8	2.64	
Palermo†	90	36	62.5	2.95	
New York—Cont'd.					
Perry City	91	27	62.1	2.00	
Phœnix				2.28	
Pine City				1.96	
Pittsford	91	34	63.9	2.45	
Plattsburg Barracks	94	35	59.7	2.85	
Port Jervis	91	32	64.5	1.48	
Potsdam	87	33	61.5	1.68	
Poughkeepsie	90	31	65.8	1.34	
Remsen	88	25	59.0	3.14	
Ridgeway				3.21	
Rome	89	30	61.4	2.51	
Romulus	93	35	65.1	1.52	
Rose†				2.37	
Saranac Lake	88	30	57.2	3.56	T.
Scottsville				2.01	
Setauket†	93	46	67.8	2.41	
Skaneateles				1.91	
South Canisteo	91	25	61.6	1.15	T.
Southeast Reservoir				0.78	
South Kortright†	87	24	59.8	2.69	
Turin	87	30	58.4	3.99	T.
Tyrone				1.97	
Varysburg	93	29	64.2	1.89	
Wappingers Falls	96	32	66.2	1.20	
Warwick				0.72	
Watertown	94	29	62.2	4.43	
Wedgwood	96	31	64.0	1.32	
West Point†	99	39	67.6	1.16	
Willets Point	98	43	68.7	1.45	
North Carolina.					
Asheville†	90	36	70.6	0.85	
Bailey				1.02	
Blowing Rock†	83	32	67.6	1.41	
Bryson City†				0.46	
Chapel Hill†	102	35	76.4	0.62	
Currituck Inlet†				0.05	
Experimental Farm	98	50	75.8	0.51	
Fair Bluff†				2.58	
Falkland*‡	96	54	75.0	1.12	
Fayetteville†	93	56	76.0	2.47	
Flat Rock	85	39	67.6	1.44	
Goldsboro†	95	53	76.4	3.96	
Greensboro†	95	47	74.4	0.23	
Greenville				1.35	
Henderson†	103	46	76.8	1.10	
Highlands	81	32	63.9	1.06	
Horse Cove†	87	37	69.6	0.64	
Lenoir*†‡	88	46	70.9	1.56	
Linville†	80	33	62.6	2.55	
Littleton†	103	33	75.8	0.88	
Louisburg†	98	50	75.1	1.32	
Lumberton†	95	50	76.4	0.80	
Lynn*†‡	92		69.4	1.33	
Mocksville†	98	48	74.2	1.09	
Moncure†	97	48	74.1	0.41	
Morganton*†‡	96	49	72.7	2.68	
Mount Airy†	94	43	71.3	1.70	
Mount Pleasant	97	48	75.3	1.79	
Murphy†				3.43	
Newbern†	100	52	78.4	1.57	
Oak Ridge†	97	42	74.4	0.11	
Pantego				1.08	
Pittsboro	95	46	73.4	0.70	
Raleigh*†‡	101	53	77.4		
Rockingham†	99	51	77.0	3.29	
Roxboro *d*†	100	45	75.4		
Rutherfordton†	87	38	72.2	0.39	
Salem	101	44	75.6		
Salisbury	100	45	76.7	0.92	
Saxon†	98	36	72.8	2.56	
Selma	100	49	75.7	0.25	
Settle	97	40	75.7	0.38	
Skyuka	90	39	66.8	0.88	
Sloan†	97	56	76.4	2.49	
Soapstone Mount†	98	43	72.8	0.28	
Southern Pines†*b*	103	53	78.7	0.11	
Southport†	93	57	76.7	3.39	
Tarboro	104	47	77.2	0.10	
Waynesville†	88	34	67.8	0.64	
Weldon†	99	48	75.2	0.07	
Willerton	98°	48°	74.4°	0.64	
North Dakota.					
Amenia	92°	21°	56.9°	0.70	
Ashley†	97	14	59.7	0.64	
Berlin	99	17	58.6	0.50	
Churchs Ferry	95	30	54.6	0.42	
Coal Harbor	99	24	56.7	0.07	
Dickinson†	96	15	55.7	0.13	T.
Falconer	100	16	58.3	T.	
Fargo†	92	21	57.6	1.55	
Forman†	102	12	59.2	0.77	
Fort Berthold†	100	17	58.4	0.27	
Fort Yates†	98	24	61.0	0.04	
Gallatin†	100	18	56.2	0.84	
Grafton†	92	21	54.2	1.60	
Jamestown†	92	20	60.3	0.27	T.
North Dakota—Cont'd.					
Lakota	78	22	52.2	0.47	
Larimore†	95	27	56.7	0.86	
McKinney	94	20	51.8	1.05	
Milton†	85	22	52.9	1.30	
Minto†				1.72	
Napoleon†	95	20	58.8	0.34	
New England City†	93	16	57.2		
Oakdale†	90	25	55.8	0.35	
Portal†‡	94	21	52.3	1.05	T.
Power†	94	19	59.3	1.13	
St. John†	90	26	51.7	1.72	
Sheyenne	90	22	56.1	1.22	
Steele†	96	30	58.1	0.08	
University†	92	25	55.2	1.57	
Wild Rice†‡			55.7	1.81	
Willow City†	99	16	58.5	1.02	
Woodbridge†	88	18	50.5	0.93	
Ohio.					
Akron	91	38	67.2	2.44	T.
Annapolis*	96	34	67.3	0.49	
Ashland	91	34	65.5	2.33	
Ashtabula	90	40	66.8	5.85	
Athens	96	35	71.3	1.74	
Atwater				2.23	
Auburn	91	30	63.1	3.13	
Bangorville	90	38	67.3	2.71	
Bellefontaine	95	30	68.2	0.44	
Bement*‡	95	34	65.0	2.69	T.
Benton Ridge	99	32	69.5	1.56	T.
Bethany	96	30	70.6	0.31	
Big Prairie	96	35	66.9	2.06	
Binola	93	41	68.1	2.68	T.
Bissells	91	35	66.9	3.15	T.
Bladensburg	93	33	67.1	1.85	
Bloomingburg	96	35	71.3	0.45	
Bloomington				0.25	
Bowling Green	97	30	69.0	0.71	
Bucyrus	94	34	68.8	3.70	
Cambridge	92	35	67.6	2.09	
Camp Dennison	100	36	73.3	0.51	
Canton†	93	36	67.6	1.11	
Carrollton	89	34	66.4	1.54	
Cedarville				0.41	
Celina	94	38	71.3	2.00	
Cherry Fork	98	33	71.7	0.31	
Circleville*a*†				0.62	
Circleville*b*	100	37	72.4	0.64	
Clarksville	97	33	71.2	0.86	
Cleveland	92	42	67.2	2.59	
Clifton	100	33	71.1	0.99	
Coalton	100	32	70.3	1.49	
Colebrook	98	35	64.6	4.25	
Dayton*a*	96	36	72.2	0.66	
Dayton*b*†				0.66	
Defiance	97	32	69.4	1.35	
Demos	94	39	70.5	1.09	
Dupont	96	33	67.1	1.80	
Ellsworth	92	35	66.5	2.59	T.
Elyria	100	37	69.4	1.83	
Fairport Harbor*‡	90	46	68.6		
Fayetteville	95	30	70.9	0.68	
Findlay	95	32	67.8	1.83	
Fostoria	96	37	68.7	0.24	
Frankfort	96	36	70.4	0.61	
Garrettsville	92	34	64.4	4.88	
Granville†	95	30	66.8	2.04	
Gratiot	93	36	67.7	1.87	
Greenfield	95	38	72.3	T.	
Greenhill	95	30	65.8	1.38	T.
Greenville	90	36	68.5	1.29	
Hackney	93	37	69.1	2.39	
Hanging Rock	97	30	71.4	1.85	
Hebbardsville	102	37	73.4	1.42	
Hedges	97	30	67.4	1.55	
Hillhouse	94	36	65.2	3.48	
Hillsboro	105	31	71.7	0.45	
Hiram	90	34	65.3	4.13	T.
Hudson	93	35	65.4	2.56	
Jacksonboro	101	34	72.4	0.20	
Kenton†	99	31	70.8	1.38	
Killbuck	92	33	66.8	3.30	
Lancaster	94	37	69.5	1.33	
Leipsic	96	30	67.2	1.08	T.
Levering	95	28	64.0	2.15	
Logan	99	34	71.6	2.85	
Lordstown	92	31	64.8	3.22	
McArthur	98	34	71.0	1.76	
McConnelsville	98	38	70.6	2.22	
Marietta*a*†				1.83	
Marietta*b*	98	39	70.9	2.08	
Marion	97	32	69.6	2.61	
Medina	94	35	67.1	1.89	T.
Milfordton	95	32	67.2	2.01	
Milligan	99	35	69.9	2.68	
Millport	92	40	71.2	1.86	
Montpelier	94	32	66.3	1.47	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Ohio—Cont'd.	°	°	°	*Ins.*	*Ins.*
Napoleon	97	33	67.7	2.25	
New Alexandria	91	39	69.0	1.71	T.
New Berlin	94	35	66.9	1.90	
New Bremen	95	33	69.3	0.85	
New Comerstown	93	35	67.5	2.00	
New Holland	95	37	70.0	1.34	
New Moscow				2.43	
New Paris	98	33	71.7	0.89	
New Waterford	98	25	64.4	1.52	
North Lewisburg	99	33	69.0	0.20	
North Royalton	94	37	68.1	1.19	
Norwalk	97	30	65.0	0.37	
Oberlin	95	36	67.9	1.87	
Ohio State University	95	33	69.9	1.49	
Ottawa	94	35	68.0	1.42	
Pataskala	96	34	69.1	1.10	
Peoli	94	35	69.1	1.57	
Philo	95	35	70.4	1.86	
Plattsburg	95	33	70.5	0.72	
Point Marblehead [10]	88	50	71.4		
Pomeroy	93	34	70.4	2.36	
Portsmouth *a* †				1.60	
Portsmouth *b*	96	38	72.0	1.60	
Ridgeville Corners	95	31	68.0	1.91	
Ripley	93	35	71.4	1.00	
Rittman	90	33	63.6	3.11	
Rocky Ridge	96	34	69.3	1.51	
Rosewood	93	32	68.4	0.27	
Sharon Center	94	40	70.4	2.22	T.
Shenandoah	96	33	66.8	1.91	
Sidney *b*	99	35	69.2	0.50	
Sinking Spring	95	35	71.6	0.51	
Springboro				0.54	
Steuben				1.66	
Stoutsville				0.86	
Sylvania	95	30	66.1	1.32	
Thurman	99	34	72.2	1.42	
Tiffin †	94	36	69.2	1.34	
Upper Sandusky	94	34	68.4	1.39	
Vanceburg	94	31	71.4	1.73	
Van Wert	98	35	69.1	1.58	
Vermilion	93	37	67.6	1.50	
Vickery	95	36	68.6	1.83	
Walnut				1.11	
Warren	92	33	65.3	2.67	
Warsaw	96	33	67.7	2.17	
Wauseon	97	32	68.8	1.18	
Waverly	100	34	73.2	1.22	
Waynesville	95	32	70.9	0.50	
Wellington	95	37	68.2	3.55	
Westerville	91	36	67.9	1.06	
Wheeler †				4.32	
Willoughby				4.29	
Wooster *a*	93	34	66.5	3.92	
Youngstown	92	34	66.0	2.12	
Zanesville †				1.82	
Oklahoma.					
Alva †	104	31	75.0	0.80	
Anadarko	108	34	80.4	T.	
Arapaho †	101	34	75.9	1.15	
Britton †				2.11	
Burnett †	102	32	78.8	0.29	
Clifton †	101	30	77.3	0.13	
Enid †	103	38	77.4	0.77	
Fort Reno †	103	38	77.7	0.60	
Fort Sill	105	41	78.4	0.06	
Guthrie †	99	37	77.6	0.89	
Hennessey				1.43	
Keokuk Falls †	100	31	77.0	0.15	
Mangum †	106	37	75.0	T.	
Norman †	102	36	76.8	0.51	
Ponca †	100	32	75.2	0.05	
Pond Creek †	102	32	76.4	0.34	
Prudence †				0.78	
Sac and Fox Agency †	100	31	76.0	0.00	
Stillwater †	102	36	77.6	1.50	
Winnview †	102	35	77.9	0.86	
Oregon.					
Albany *a* †	85	32	57.6	2.64	
Arlington †	83	38	59.0	0.80	
Ashland *b*	89	37	58.2	0.67	
Aurora [8]	87	35	60.1	1.31	
Aurora (near)	82	29	55.9	1.80	
Baker City					T.
Bandon	68	39	55.6	10.28	
Brownsville [8]	84	32	57.9	2.59	
Burns	82	15	44.9		
Canyon City †	91	30	58.0	2.88	
Cascade Locks	78	34	52.4	3.88	
Comstock [8]	88	36	55.7	3.20	
Corvallis *a*	84	30	55.4	2.15	
Corvallis (near)	80	32	57.2	2.98	
Dayville †	85	32	56.8	1.20	
Detroit †	83	32	54.3	3.46	T.
Eugene †				1.90	
Fife †	81	30	56.3	1.00	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Oregon—Cont'd.	°	°	°	*Ins.*	*Ins.*
Gardiner	78	43	55.8	5.90	
Glenora	83	30	54.2	4.61	
Grants Pass *a* †	90	31	58.2	2.33	
Happy Valley †	86	17	51.1	2.29	0.5
Heppner †	77	31	54.3	1.37	T.
Hood River (near)	75	29	52.3	2.91	
Hubbard	82	29	55.2	1.55	
Irvington [8]	81	32		1.21	
Jacksonville	86	30	57.4	1.37	
Joseph †	76	26	48.2	2.95	0.2
Junction City [8]	88	34	58.3	0.17	
Klamath Falls	85	25	56.5	0.70	
Lafayette [8]	90	38	57.5	3.17	
Lakeview †	83	23	53.6	0.60	
Langlois	83	37	56.7	7.85	
Lone Rock	76	20	48.7	1.19	0.5
Lorella	80	21	53.4	0.80	
McMinnville *a* †	83	29	56.2	3.18	
McMinnville *b* [8]	80	44	56.5	3.76	
Merlin [8]	94	34	59.4	0.33	
Monmouth [8]	82	39	58.7	2.69	
Mount Angel †	85	32	57.8	2.59	
Mount Hood	63	22	42.2		8.5
Nehalem				5.33	
New Bridge	84	28	55.7	0.19	
Newport	74	33	54.2	4.10	
Pendleton	85	27	56.6	1.28	
Riddles [8]	86	34	53.9	2.85	
Salem *a* [8]	84	45	61.5	1.98	
Salem *b* †	84	35	57.0	2.18	
Salmon	74	20	46.4		9.5
Sheridan [8]	87	35	57.9	2.85	
Silverton [8]	86	36	55.6	1.81	
Siskiyou [8]	87	35	56.9	T.	
Sparta	80	24	53.6	3.04	
Springbrook	82	35	57.8	2.07	
Springfield [8]	79	32	55.1	1.76	
The Dalles †	83	35	59.4	1.14	
Tillamook Rock L. H. †				2.06	
Vale	88	24	54.7	1.60	
West Fork [8]	80	40	57.5	4.17	
Weston	79	31	55.6	1.88	
Williams	85	31	56.4	2.35	
Pennsylvania.					
Altoona	89	40	69.3	2.28	
Aqueduct	98	35	68.4	2.24	
Beaver Dam †				1.08	
Bethlehem				0.63	
Blooming Grove [1]	94	38	64.6	1.35	
Brookville †				3.37	
Browers Lock				0.47	
Cameron				2.50	
Carlisle	100	36	69.8	1.06	
Cassandra	82	37	64.2	3.69	T.
Center Hall				2.10	
Chambersburg †	96	42	67.8	0.82	
Clarion †				4.60	T.
Coatesville	100	35	69.8	1.42	
Confluence †				0.68	
Coopersburg	91	38	68.4	0.75	
Davis Island Dam †				1.38	
Doylestown				0.73	
Drifton	91*	30*	66.2*	2.08	
Driftwood				3.51	
Dubois †				1.60	
Duncannon				1.69	
Dyberry †	94	26	62.3	0.95	
East Bloomsburg				1.43	
East Mauch Chunk	97	30	66.6	1.00	
Easton	92	36	67.8	0.74	
Edinboro [1]	84	35	63.3		1.0
Ellwood Junction †				1.19	
Emporium	88	34	63.8	2.89	
Farrandsville				5.87	
Forks of Neshaminy [1]	90	50	69.5	0.77	
Frederick				0.84	
Freeport †				0.98	
Gettysburg †	99	30	69.2	1.94	
Girardville				2.69	
Grampian	90	36	65.1	2.20	T.
Greensboro †				0.55	
Hamburg	100	36	70.8	1.62	
Hollidaysburg	96	31	68.0	1.91	
Honesdale	88	30	62.4	2.12	
Huntingdon *a* †	97	32	68.8	1.36	
Huntingdon *b*				2.09	
Johnstown †				3.75	
Karthaus				1.81	
Keating				3.64	
Kennett Square	97	39	70.2	1.55	
Lancaster	96	37	69.0	1.61	
Lansdale				0.71	
Lebanon	98	35	69.4	1.32	
Le Roy †	88	32	63.7	3.11	T.
Lewisburg	96	34	67.2	4.11	
Lock Haven †	96	36	67.8	3.18	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Pennsylvania—Cont'd.	°	°	°	*Ins.*	*Ins.*
Lock No. 4 †				0.55	
Lycippus	92	38	70.2	1.08	
Mahoning †				0.69	
Mifflin				3.88	
Nisbet				2.82	
Oil City †				5.15	
Ottsville				0.59	
Parker †				2.77	
Philadelphia *a*				0.81	
Philadelphia *b*	98	43	72.4	0.55	
Philadelphia *c*	97	49	73.0	0.81	
Pittsburg					T.
Point Pleasant				0.55	
Pottstown	98	40	70.8	1.01	
Quakertown	98	33	68.4	0.87	
Reading [2]			67.2	0.37	
Renovo				2.38	
Ridgway †				2.90	
Saegerstown	91	29	63.2	5.41	T.
Salem Corners	96	31	66.2	2.42	
Saltsburg †				3.34	
Scranton	95	29	65.6	2.21	
Seisholtzville				1.01	
Selinsgrove	95	32	65.8	1.53	T.
Shinglehouse	88	24	61.4	3.00	
Sinnamahoning				1.13	
Smethport	92	29	61.8	2.08	
Smiths Corners				0.70	
Somerset	96	31	66.6	0.50	T.
South Bethlehem	96	46	71.4		
South Eaton	92	30	65.3	1.68	
Spruce Creek				2.15	
State College	91	34	63.7	1.75	
Stoyestown †				0.72	
Sunbury				2.50	
Towanda	94	28	64.6	1.47	
Trout River				2.80	
Uniontown	92	40	69.7	1.22	T.
Warren †				2.12	
Wellsboro * [1]	92	28	58.7	1.12	T.
West Chester	97	41	70.7	0.62	
West Newton †				0.69	
Westtown [4]	96	40	69.6	0.67	
White Haven	97	35	68.6	1.84	
Wilkesbarre †	95	30	67.4	1.59	
Williamsport	92	36	66.6	2.12	
York †	95	37	69.6	4.01	
Rhode Island.					
Bristol				1.21	
Kingston	94	37	64.5	1.29	
Lonsdale				2.45	
Pawtucket	92	37	64.6	2.43	
Providence *a*	93	44	67.4	2.30	
Providence *c*	95	40	65.7	2.43	
South Carolina.					
Allendale †	92	58	76.2	1.32	
Anderson †				0.99	
Batesburg †	96	48	76.7	1.06	
Blackville †	93	56	77.0	0.11	
Camden †				0.92	
Central †	97	57	76.3	T.	
Cheraw *a* †	98	51	75.7	0.54	
Cheraw *b* †	92	54	76.8	0.65	
Conway †				2.88	
Darlington				1.13	
Edisto †				1.00	
Effingham †				1.86	
Florence †	97	60	78.6	1.47	
Georgetown †	91	64	78.0	1.70	
Gillisonville †	96	49	76.8	2.70	
Greenville †	92	56	74.2	2.32	
Greenwood †	94	52	76.8	0.10	
Holland †	94	35	76.3	0.69	
Kingstree *a* †	94	59	76.8	1.09	
Kingstree *b* †				0.76	
Little Mountain	102	51	80.0	0.12	
Longshore †	96	48	76.2	T.	
McCormick * [1]	97	52	76.0		
Mount Carmel †				0.35	
Pinopolis [1]	86	56	75.0	0.97	
Port Royal †	90	62	79.3	5.93	
Red Hill [2]		49	73.5	0.50	
Ridgeway †	98	53	76.7	0.50	
St. George †	92	58	76.6	1.86	
St. Matthews †	97	58	77.9	1.41	
St. Stephens †				1.02	
Santuck †	94	49	75.4	1.08	
Shaws Fork * [1]	100	60	81.0		
Society Hill †	94	41	74.8	0.78	
Spartanburg †	100	44	77.4	0.34	
Statesburg †	93	55	77.0	0.83	
Trenton	93	58	78.3	0.20	
Trial †	95	58	76.7	1.85	
Yemassee †	95	57	76.7	1.97	
Yorkville	97	47	76.8	1.39	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
South Dakota.	°	°	°	*Ins.*	*Ins.*
Aberdeen†	101	18	62.2	0.85	
Alexandria†	109	20	63.2	2.50	
Ashcroft†	97	13	58.2	0.55	T.
Bowdle*†[1]	92	30	60.7	0.00	
Brookings†	100	23	62.7	3.24	
Castlewood†	103	18	61.4	2.30	
Cross†	95	16	56.0	0.32	3.0
De Smet†	105	28	62.2	2.53	
Edgemont				0.28	
Farmingdale				0.15	
Faulkton†	99	23	61.4	0.63	
Flandreau†	104	21	64.2	3.82	
Forestburg†	112	18	63.4	1.73	
Forest City†	102	25	64.5	0.00	
Fort Meade	101	25	65.0	0.80	T.
Gary†	108	27	57.3	2.52	
Greenwood	106	27	66.4	3.66	
Highmore†*	100	23	62.4	0.70	
Hitchcock				1.40	
Hotch City†	104	25	65.4	0.53	
Howard†	106	23	63.9	2.22	
Kimball†	102	27	65.4	1.66	
Leslie†	100	18	65.0	0.40	
Mellette†[4]	102	27	66.6	0.76	
Millbank†	103	20	60.2	1.50	
Northville*[1]	103	17	62.7	1.00	
Nowlin†	106	21	63.2	0.03	
Oelrichs	105	21	62.1	0.44	4.4
Parker†	104	28	64.7	2.95	
Parkston†	103	25	61.4	2.82	
Plankinton†	103	23	64.5	2.51	
Rapid City					1.6
Rosebud†	103	18	63.2	0.67	
Shiloh†	103	20	60.6	0.32	
Silver City				0.85	4.0
Sioux Falls†	103	20	64.8	2.97	
Tyndall†	102	27	66.8	4.40	
Watertown†	100	12	58.9	1.60	
Webster†	104	17	63.0	2.30	
Wentworth†	103	23	64.4	2.79	
Wessington Springs†	101	32	65.7	1.39	
Yankton	104	29	64.0	4.36	
Tennessee.					
Andersonville*†	92	45	71.1	1.89	
Arlington†	96	40	74.8	0.32	
Ashwood*†[1]	90	43	73.4	5.20	
Bolivar†	98	38	76.7	0.61	
Bristol	89	27	69.0	0.05	
Brownsville†	97	40	78.8	0.06	
Byrdstown†	91	38	74.2	1.34	
Carthage†				4.60	
Clarksville	94	40	74.6	2.78	
Clinton†				0.65	
Columbia†				4.10	
Covington δ†	100	43	78.0	0.25	
Dyersburg†	96	42	75.8	1.06	
Elizabethton†	97	33	74.6	0.64	
Fairmount*[1]	84	45	70.4	1.08	
Florence†	95	36	74.0	2.19	
Franklin	93	37	73.0	2.87	
Greeneville†	93	32	71.8	3.29	
Hohenwald*†[3]		38	68.8	0.85	
Jacksboro*[3]	89	37	69.4	2.67	
Johnsonville†				1.75	
London				2.05	
Lynnville*[1]	95	45	74.1	7.48	
McMinnville†	91	36	73.0	2.65	
Milan†	97	36	76.1	1.91	
Mount Carmel	92	43	75.7	0.36	
Newport*[3]	92	36	70.7	1.23	
Nunnelly*[1]	93	42	74.3	1.40	
Palmetto†				4.29	
Riddleton†	91	36	74.2	2.47	
Rockwood†				2.97	
Rogersville*[1]	92	36	70.4	0.99	
Rugby				1.53	
Savannah	95	45	78.8	2.00	
Springdale*[1]†	94	30	74.1	3.25	
Trenton	95	39	74.8	1.62	
Tullahoma*†[1]	89	33	69.4	2.35	
Waynesboro*[1]	92	36	72.8	1.05	
Texas.					
Albany*†[1]	90	54	74.0	4.55	
Angleton	94	50	78.8	1.96	
Arthur City†				0.65	
Aurora*[1]	100	52	80.5	0.00	
Austin a†	99	59	81.7	2.80	
Austin δ*[3]	98	51	81.0		
Ballinger†	98	49	76.8	2.04	
Beeville†	102	58	83.5	3.26	
Boerne*†[3]	95	51	79.8	4.30	
Brady†	102	51	80.4	1.19	
Brazoria†	92	54	80.1	2.68	
Brenham†	98	55	82.6	0.18	
Burnet*†[1]	96	56	81.9	1.70	
Camp Eagle Pass†	100	54	81.6	5.95	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Texas—Cont'd.	°	°	°	*Ins.*	*Ins.*
Chillicothe	101	42	77.9	0.00	
Coleman*[3]		52	75.0	2.16	
College Station	98	51	79.6	1.12	
Colmesneil				1.98	
Columbia†	93	50	79.4	3.76	
Corsicana a	104	47	84.4	0.55	
Corsicana δ†				2.37	
Cuero†	98	54	81.8	3.43	
Dallas†	98	45	78.8	3.68	
Dean† (b)	100	31	69.8	0.00	
Devine	97	54	80.2	1.25	
Dublin†	98	48	78.4	3.34	
Durham†				T.	
Duval*[1]	104	56	83.0	1.25	
Estelle†	100	45	80.8	0.37	
Forestburg†	98	46	77.4	0.30	
Fort Brown†	94	60	81.0	5.72	
Fort Clark	98	58	82.8	1.68	
Fort Hancock	102	40	73.0	0.00	
Fort McIntosh	97	56	82.5	0.86	
Fort Ringgold†	99	56	82.2	3.80	
Fort Stockton				6.79	
Fort Worth	99*	48*	81.0*	1.91	
Fredericksburg*†[1]	96	54	78.3	2.46	
Gainesville†	100	45	82.3	0.75	
Georgetown*[1]	94	53	78.0	1.93	
Golindo				2.50	
Graham†	105	47	81.2	0.73	
Grape Vine†	102	48	80.3	0.69	
Hale Center†	95	38	71.3	0.20	
Hallettsville†	100	58	82.8	3.02	
Happy†	97	30	70.4	0.60	
Haskell†	101	50	79.6	0.01	
Hearne†		54		0.98	
Henrietta†	101	47	81.2	0.31	
Hewitt				0.85	
Houston†		53		0.68	
Huntsville†	96	50	80.9	1.10	
Kent				3.01	
Kerrville†	99	50	78.0	3.16	
Lampasas†	102	50	80.6	0.72	
Leakey†	94	56	80.6	2.20	
Llano*†[1]	100	55	83.4	1.80	
Longview†	100	56	81.3	0.01	
Lufkin†	100	60	81.6	0.14	
Luling†	98	56	81.3	0.92	
Marshall†	99	44	78.9	0.70	
Menardville*†[1]	95	52	77.1	2.21	
Midland†	102	41	73.0	2.45	
Mount Blanco*†[1]	99	46	71.8	0.00	
New Braunfels†	97	57	79.4	0.60	
Orange†	93	45	79.5	0.14	
Paris†	99	44	79.4	1.99	
Roby†	105*	42*	78.6*	0.78	
Rockport*[1]	94	62	82.6		
Rock Springs*†[1]	104	52*	79.5*	3.85	
Round Rock				1.33	
Runge†	90	57	83.8	2.25	
San Antonio	99	56	81.9	1.14	
San Marcos a†				1.64	
San Marcos δ†	100	56	82.1	1.89	
Sierra Blanca†	95	40	75.8	1.93	
Stafford	99	49	80.7	1.70	
Sulphur Springs†	108	54	83.6	1.43	
Temple†	98	50	79.7	3.15	
Tyler†	98	46	79.7	0.39	
Waco†	99	51	81.2	1.55	
Weatherford†	97	50	79.5	1.35	
Wichita Falls†	102	52	81.6	T.	
Utah.					
Blue Creek*[3]	82	35	65.0		
Brigham City				0.61	
Cisco†	98	29	67.7	0.14	
Corinne*[3]	90	33	68.7	0.48	
Deseret	89	25	61.4	0.80	
Fillmore†	99	9	63.0	1.66	
Fort Duchesne†	91	24	60.4	0.03	
Giles†	99	25	65.8	0.35	
Grouse Creek*†[1]	96	25	52.4	0.19	
Grover†	87	16	58.6	0.13	T.
Heber†	88	18	56.2	0.50	
Huntsville				0.92	6.0
Kelton*[3]	89	35	62.9	0.20	T.
Koosharem	87	11	56.2	0.46	
Levan†	88	21	65.9	0.91	6.5
Loa	84	16	55.1	0.77	T.
Logan	96	26	58.4	1.96	
Manti†	96	20	62.7	0.40	1.0
Millville†				2.28	
Moab†	93	32	66.4	0.36	
Moroni†				0.45	1.0
Mount Pleasant*†[1]	88	29	62.2	0.65	3.0
Ogden a*[3]	92	28	62.0	0.50	
Ogden δ*[1]	84	36	62.8	0.67	
Orton†	88	15	54.2	T.	
Pahreah†	95	32	65.3	1.00	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Utah—Cont'd.	°	°	°	*Ins.*	*Ins.*
Parowan†	90	23	60.4	0.29	0.5
Promontory*[3]	91	34	68.6	0.00	
Provo City†			58.8	0.06	
St. George†	103	25	70.2	0.02	
Salt Lake City					T.
Scipio				0.38	1.0
Snowville†	86	14	50.0	0.39	
Soldier Summit†	85	19	52.6	0.37	
Terrace*[3]	94	32	64.5	0.00	
Thistle†	94	29	58.3		
Vernal†	86	24	60.8	0.38	
Vermont.					
Brattleboro	91	32	62.8	3.37	
Burlington†	88	41	63.8	3.64	
Chelsea*[1]	86	38	57.1	2.40	
Cornwall	90	35	61.6	2.17	
Enosburg Falls†	88	32	61.0	2.20	
Hartland†	90	28	57.8	3.35	
Irasburg†	87a	30a	58.4a	2.62	
Jacksonville	85	25	56.8	3.33	
Norwich				2.79	
St. Johnsbury	87	31	58.5	3.16	T.
Simonsville	86	26	53.0	3.80	
Strafford*†[1]	85	34	58.4	2.40	
Vernon*[3]	91	36	63.1	3.80	
Wells	86	32	61.3	2.71	
Woodstock	91	29	58.8	2.91	
Virginia.					
Abingdon†				1.29	
Alexandria	98	40	74.4	1.36	
Ashland†	100	43	72.4	0.13	
Bedford City	93	45	73.0	0.25	
Big Stone Gap†	89	25	66.6	1.97	
Birdsnest*†[1]	100	50	75.2	1.70	
Blacksburg	92	32	68.1	0.79	
Buchanan†				1.20	
Callaville†	96	48	73.0	2.24	
Christiansburg†				2.04	
Dale Enterprise†	97	36	69.7	0.20	
Fredericksburg†	93	48	73.3	0.53	
Hampton	96	56	76.5	0.45	
Hot Springs	90	42	68.6	0.36	
Irwin†	99	43	72.0	0.74	
Lexington†	98	42	72.2	0.91	
Manassas	98	40	71.2	0.84	
Marion	86	35	67.2	0.40	
Monterey†	90	36	63.6	1.65	
Nottoway	104	44	76.6	0.93	
Petersburg†	103	44	75.9	0.34	
Richmond (near)†	107	45	76.7	0.43	
Richmond δ†				0.70	
Rockymount†	96	45	74.5	T.	
Salem†	97	44	75.3	1.59	
Saltville	92	35	69.9	0.28	
Smithville†	93	45	73.6	0.40	
Spottsville†	100	43	73.8	0.40	
Stanardsville†	98	42	72.4	0.67	
Staunton†	100	40	72.2	0.44	
Stephens City†	98	41	72.2	1.09	
Sunbeam†	98	46	74.7	0.05	
Warsaw†	98	45	73.8	1.31	
Westbrook Farm	100	48	73.8		
Washington.					
Ashford				3.27	
Blaine	70	35	51.2	4.62	
Cascade Tunnel†	78	26	47.3	5.64	1.0
Colfax†	81	24	52.4	1.55	
Connell	90	30	57.6		
Dayton	81	28	54.8	1.68	
East Sound	68	37	54.0	1.36	
Ellensburg	78	30	52.0	0.98	
Ellensburg (near)	84	28	54.3	0.85	
Fort Simcoe	81	37	57.6	1.65	
Fort Spokane	96	36	58.6	0.14	
Grand Mound†	78	27	54.4	1.88	
Hunters†	82	22	45.2	2.12	T.
Kennewick†	85	35	58.9	0.78	
Lakeside†	86	34	55.8	0.75	
Lapush	67	35	54.8	4.90	
Madrone*†[1]	70	33	54.1	1.10	
Monte Cristo†	76	31	50.0	11.45	2.0
Moxee Valley†	87	28	56.4	0.51	
New Whatcom†	71	28	52.3	3.70	
Olga†	68	30	56.8	1.62	
Pine Hill†	80	30	56.3	1.15	
Pomeroy†	84	40	58.1	1.56	
Rosalia†	86	28	51.0	2.02	
Silver Creek*[1]	80	31	52.3	3.17	
Snohomish†	77	31	55.2	1.75	
South Bend†	84	35	54.6	2.23	
Stillaguamish†	71	27	52.0	2.17	
Sunnyside†	84	30	57.6	0.73	
Tacoma†	76	33	54.2	1.32	
Union City†	74	33	55.2	1.30	
Vashon	77	28	49.8	0.82	
Waterville†	85	25	51.3	1.16	

TABLE II.—*Meteorological record of voluntary and other cooperating observers*—Continued.

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Washington—Cont'd.	°	°	°	*Ins.*	*Ins.*
West Ferndale†	73	31	54.0	4.54	
West Virginia.					
Beverly†	90	38	70.0	2.61	
Bloomery†	94	35	67.0	.....	
Bluefield†	96	33	71.3	1.18	
Buckhannon *a*†	.....	.....	.....	2.05	
Buckhannon *b*†	92	39	66.9	.....	
Charleston†	.....	.....	.....	1.05	
Dayton *[1]*	95	42	69.3	.....	
Elkhorn†	88	34	68.4	0.98	
Ella†	93	38	71.4	1.34	
Fairmont†	.....	.....	.....	1.10	
Glenville	90	38	68.9	3.74	
Grafton†	93	39	69.5	0.44	
Green Sulphur	93	40	72.0	2.18	
Harpers Ferry†	.....	.....	.....	1.18	
Hewett†	96	33	73.3	0.68	
Hinton *a*†	.....	.....	.....	4.37	
Hinton *b*†	91	36	70.6	.....	
Leachtown†	.....	.....	.....	1.60	
Martinsburg†	95	42	69.0	1.77	
Monarch	88	40	68.3	.....	
Morgantown *a*†	.....	.....	.....	1.30	
Morgantown *b*†	94	38	69.7	1.25	
New Martinsville†	95	41	70.6	1.98	
Nuttallburg†	107	29	72.1	0.75	
Pennsboro	101	31	71.4	.....	
Philippi†	.....	.....	.....	1.33	
Point Pleasant†	95	39	72.6	1.76	
Powellton†	88	33	66.6	1.60	
Rowlesburg†	.....	.....	.....	0.42	
Sandyville†	93	30	69.9	2.60	
Spencer	98	32	74.8	4.25	
Tannery *[1]*	95	38	70.5	.....	
Weston *a*†	.....	.....	.....	1.69	
Weston *b* *[1]*	92	42	70.3	1.69	
Wheeling *a*†	.....	.....	.....	1.77	
Wheeling *b*†	95	44	71.4	1.96	
White Sulphur Springs†	92	30	68.7	1.65	
Wisconsin.					
Amherst	96	25	65.4	3.60	
Antigo	94	24	60.0	5.11	
Apollonia *†[1]	92	28	63.7	4.99	
Barron†	90	23	59.2	3.90	
Belleville	96	23	65.7	0.73	
Beloit	93	29	68.1	1.58	
Berlin	98	36	66.8	1.23	
Black River Falls†	96	30	65.8	3.93	
Butternut	91	28	61.1	10.21	
Centralia	97	27	65.1	1.63	
Chilton	96	32	64.4	2.11	
City Point	98	31	65.6	2.36	
Crandon†	90	25	64.8	6.30	
Delavan†	90	34	66.1	2.93	
Depere†	95	32	64.8	1.07	
Eau Claire	99	28	63.8	4.06	
Florence†	87	27	59.2	5.85	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Wisconsin—Cont'd.	°	°	°	*Ins.*	*Ins.*
Fond du Lac†	96	25	66.3	1.05	
Grantsburg†	93	27	62.6	4.70	
Hartford	.....	.....	.....	3.10	
Harvey†	94	28	65.3	1.50	
Hayward	91	27	59.8	6.58	
Hillsboro	96	24	65.4	1.62	
Janesville†	95	28	67.8	0.67	
Kenosha *[10]	92	40	67.1	.....	
Koepenick *†[1]	88	32	62.4	4.40	
Lancaster†	93	30	65.8	3.42	
Lincoln†[2]	.....	.....	64.1	2.06	
Madison†	90	34	67.2	1.82	
Manitowoc†	95	33	60.4	1.16	
Meadow Valley†	97	25	64.2	1.88	
Medford†	97	26	62.2	3.32	
Neillsville†	95	31	63.4	3.44	
New Holstein	96	31	63.7	1.38	
Oconomowoc†	95	31	67.1	1.43	
Oconto	97	28	62.6	3.98	
Osceola†	99	28	62.9	5.72	T.
Oshkosh	94	34	69.4	1.92	
Pepin	94	29	64.6	3.79	
Pine River†	98	27	65.8	1.73	
Port Washington	96	30	64.6	1.43	
Prairie du Chien	100	34	67.2	2.48	
Racine *[10]	90	31	63.4	.....	
Rhinelander	91	30	58.2	3.04	T.
Royalton	98	29	63.4	2.66	
Sharon†	92	27	66.2	3.85	
Shawano	98	26	61.8	2.15	
Spooner†	95	28	59.6	4.69	
Stevens Point†	97	27	65.2	2.91	
Sturgeon Bay Canal *[10]	80	36	58.2	.....	
Two Rivers *[10]	84	35	59.3	.....	
Valley Junction†	96	27	63.9	2.48	
Viroqua	95	32	65.6	2.37	
Watertown†	93	27	67.1	1.82	
Waukesha†	93	33	67.0	1.56	
Wausau†	94	28	62.8	3.33	
West Bend	92	30	65.4	0.85	
Westfield†	94	27	66.3	1.44	
Whitehall†	97	26	64.6	4.80	
Wyoming.					
Big Horn Ranch	83	8	51.5	0.54	4.0
Cheyenne	.....	.....	.....	.....	3.3
Fort Laramie†	101	19	63.2	0.16	
Fort Washakie	90	5	55.2	2.17	21.7
Fort Yellowstone†	80	0	50.4	0.43	2.2
Lander (V. O.)	85	12	55.5	2.26	20.5
Lander (W. B.)	.....	.....	.....	.....	16.7
Laramie	83	8	54.5	0.18	2.0
Lusk	96	16	58.0	0.33	
Sheridan	93	7	54.4	1.40	6.0
Sundance	98	21	55.4	0.75	6.0
Wheatland	98	25	67.4	0.60	6.0
Mexico.					
Ciudad P. Diaz	98	58	82.4	5.90	

Stations.	Temperature. (Fahrenheit.) Maximum.	Minimum.	Mean.	Precipitation. Rain and melted snow.	Total depth of snow.
Mexico—Cont'd.	°	°	°	*Ins.*	*Ins.*
Leon de Aldamas	87	51	68.8	2.34	
Mexico	78	48	63.4	3.20	
Puebla	82	51	65.7	4.98	
Topolobampo *[1]	99	77	85.8	4.49	
New Brunswick.					
St. John	71	38	56.8	1.97	
West Indies.					
Grand Turk Island	.....	.....	.....	2.17	

EXPLANATION OF SIGNS.

* Extremes of temperature from observed readings of dry thermometer.

† Weather Bureau instruments.

‡ Record furnished by the Arrowhead Reservoir Company, in the San Bernardino Mountains, San Bernardino County, Cal., at elevations varying from 4,900 to 6,900 feet.

A numeral following the name of a station indicates the hours of observation from which the mean temperature was obtained, thus:

[1] Mean of 7 a. m. + 2 p. m. + 9 p. m. + 9 p. m. ÷ 4.
[2] Mean of 8 a. m. + 8 p. m. ÷ 2.
[3] Mean of 7 a. m. + 7 p. m. ÷ 2.
[4] Mean of 6 a. m. + 6 p. m. ÷ 2.
[5] Mean of 7 a. m. + 2 p. m. + 2.
[6] Mean of readings at various hours reduced to true daily mean by special tables.
[7] Mean from hourly readings of thermograph.
[8] Mean of 7 a. m. + 2 p. m. + 9 p. m. ÷ 3.
[9] Mean of sunrise and noon.
[10] Mean of sunrise, noon, sunset, and midnight.

The absence of a numeral indicates that the mean temperature has been obtained from daily readings of the maximum and minimum thermometers.

An italic letter following the name of a station, as "Livingston *a*," "Livingston *b*," indicates that two or more observers, as the case may be, are reporting from the same station. A small roman letter following the name of a station, or in figure columns, indicates the number of days missing from the record; for instance, "s" denotes 14 days missing.

No note is made of breaks in the continuity of temperature records when the same do not exceed two days. All known breaks, of whatever duration, in the precipitation record receive appropriate notice.

CORRIGENDA.

Illinois, Atlanta, June, 1895, make precipitation 4.12 instead of 0.88. Page 282, July Review, the mean temperature at St. Lawrence Island, should read —9.9 instead of —2.9.

NOTE.—The following change has been made: North Dakota, Washburn changed to Falconer.

TABLE III.—*Data from Canadian stations for the month of September*, 1895.

Stations.	Pressure. Mean not reduced.	Mean reduced.	Departure from normal.	Temperature. Mean.	Departure from normal.	Precipitation. Total.	Departure from normal.	Prevailing direction of wind.
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*	
St. Johns, N. F	29.82	29.96	— .08	52.6	— 2.8	3.47	.....	w.
Sydney, C. B. I	29.91	29.97	— .06	56.1	+ 0.1	2.86	— 0.38	sw.
Grindstone, G. of St. L.	29.84	29.87	.....	54.2	.....	2.22	.....	sw.
Sable Island	29.98	.....	.....	58.9	.....	2.64	.....	sw.
Halifax, N. S	29.88	30.01	— .04	57.6	+ 1.1	2.45	— 1.10	sw.
Grand Manan, N. B	29.94	29.99	.....	56.7	.....	2.22	+ 0.42	w.
Yarmouth, N. S	29.93	30.01	— .06	55.8	+ 0.3	2.63	+ 0.04	sw.
St. Andrews, N. B	.....	.....	.....	55.0	.....	1.25	— 1.37	nw.
Charlottetown, P. E. I.	29.92	29.96	.....	57.2	.....	3.61	+ 0.75	s.
Chatham, N. B	29.93	29.95	— .06	55.4	+ 2.4	1.34	— 1.38	w.
Father Point, Que	29.88	29.91	— .07	50.1	+ 0.1	1.66	— 1.14	w.
Quebec, Que	29.64	29.96	— .06	55.6	+ 0.6	2.22	— 1.45	w.
Montreal, Que	29.77	29.97	— .06	58.9	+ 1.4	3.40	+ 0.17	sw.
Rockliffe, Ont	29.44	29.95	— .08	54.2	+ 1.7	3.02	— 0.68	nw.
Kingston, Ont	29.69	30.00	— .04	60.4	+ 0.9	1.62	— 1.15	sw.
Toronto, Ont	29.64	30.02	— .04	59.1	+ 1.1	2.45	— 0.30	sw.
White River, Ont	28.57	29.91	.....	49.1	+ 0.2	2.92	— 0.16	s.
Port Stanley, Ont	29.40	30.03	— .02	61.2	.....	3.37	+ 0.72	sw.

TABLE III.—*Data from Canadian stations*—Continued.

Stations.	Pressure. Mean not reduced.	Mean reduced.	Departure from normal.	Temperature. Mean.	Departure from normal.	Precipitation. Total.	Departure from normal.	Prevailing direction of wind.
	Inches.	*Inches.*	*Inches.*	°	°	*Inches*	*Inches.*	
Saugeen, Ont	29.29	29.99	— .05	60.0	+ 3.5	1.88	— 1.63	w.
Parry Sound, Ont	29.30	29.98	— .05	57.0	+ 1.5	2.11	— 2.22	w.
Port Arthur, Ont	29.16	29.85	— .11	52.6	+ 2.1	4.27	+ 0.80	sw.
Winnipeg, Man	29.00	29.82	— .10	49.1	+ 0.1	1.14	— 0.86	w.
Minnedosa, Man	28.62	29.82	— .10	46.8	+ 0.3	1.98	+ 0.56	w.
Qu'Appelle, Assin	27.60	29.86	— .06	46.0	— 2.5	1.57	+ 0.43	nw.
Medicine Hat, Assin	27.57	29.86	— .02	49.0	— 5.5	1.88	+ 1.03	w.
Swift Current, Assin	27.30	29.88	— .06	47.0	— 4.0	0.97	— 0.16	w.
Calgary, Alberta	26.29	29.85	— .05	42.6	— 6.9	2.53	+ 1.03	w.
Prince Albert, Sask	28.30	29.82	.....	44.8	.....	1.85	.....	w.
Edmonton, Alberta	27.54	29.89	— .01	43.7	— 4.9	1.94	+ 0.45	nw.
Battleford, Sask	28.08	29.81	.....	46.1	.....	1.36	.....	nw.
Spences Bridge, B. C	29.11	29.93	.....	53.9	.....	0.02	.....	w.
Hamilton, Bermuda	29.92	30.08	+ .01	78.2	.....	9.28	.....	s.
Banff, Alberta	25.34	30.01	.....	39.0	.....	2.49	.....	sw.
Esquimalt, B. C	29.96	29.99	.....	50.7	.....	1.32	.....	s.
Anticosti, Gulf of St. L.	29.82	29.85	— .07	50.0	— 0.2	2.32	.....	nw.

TABLE IV.—*Mean temperature for each hour of seventy-fifth meridian time, September, 1895.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N Dak	51.2	50.0	49.0	47.6	46.5	46.0	46.0	47.3	50.8	55.3	60.5	65.7	68.2	70.7	72.6	74.0	74.1	73.4	70.3	66.0	60.6	57.4	54.6	52.2	58.8
Boston, Mass	62.1	61.4	60.8	60.2	59.9	59.7	60.8	63.1	65.2	66.9	68.9	70.6	71.7	71.9	71.4	70.7	69.5	68.1	66.4	65.1	64.3	63.4	62.5	62.0	65.3
Buffalo, N Y	63.0	62.2	61.7	60.9	60.4	60.6	61.5	63.7	65.7	66.6	67.8	68.4	69.7	70.2	70.5	70.3	69.8	68.2	66.5	65.4	64.5	64.1	63.6	63.2	65.4
Chicago, Ill	66.1	65.5	64.7	63.8	63.5	63.1	62.5	63.4	65.3	67.4	68.8	70.2	71.5	72.1	72.8	73.6	74.6	74.6	73.2	71.4	70.4	69.0	67.8	66.5	68.4
Cincinnati, Ohio	69.2	68.5	67.7	66.9	65.6	65.2	64.5	65.9	68.2	71.6	74.5	76.8	78.5	79.3	80.1	80.5	80.4	80.0	78.7	77.0	75.2	73.6	71.7	69.9	72.9
Cleveland, Ohio	65.2	64.5	64.0	63.6	64.0	62.5	62.4	64.2	67.2	69.3	70.7	71.5	72.9	73.4	73.3	73.1	72.8	71.4	69.9	68.3	67.1	66.5	66.2	65.5	67.9
Detroit, Mich	63.7	63.1	62.5	62.1	61.4	60.9	60.5	61.9	64.2	66.6	69.4	70.7	71.8	72.7	73.5	73.5	73.1	71.7	69.6	67.2	66.3	65.3	64.6	63.7	66.7
Dodge City, Kans	68.4	67.5	66.6	66.6	65.7	62.6	62.0	62.0	65.5	70.2	74.9	78.2	80.8	82.5	84.0	84.8	84.8	83.9	81.3	77.0	73.9	71.8	69.8	69.0	72.9
Eastport, Me	52.4	52.2	51.8	51.4	51.0	51.6	53.0	54.9	57.0	59.0	60.0	60.8	60.6	60.6	60.9	60.7	59.3	57.6	56.0	55.8	54.7	53.9	53.0	52.6	55.9
Galveston, Tex	80.9	80.8	80.7	80.5	80.2	79.9	79.6	79.9	80.3	81.1	81.8	82.4	82.3	82.5	82.7	82.8	82.5	82.3	82.2	81.5	81.2	81.0	80.7	80.5	81.3
Havre, Mont	48.0	47.0	46.9	46.4	45.4	44.2	42.6	42.4	44.6	47.6	52.9	55.5	58.7	60.5	62.5	63.5	63.5	63.8	62.5	60.4	55.5	52.6	50.2	49.1	52.8
Kansas City, Mo	69.1	68.5	68.0	67.5	66.7	66.0	65.6	66.2	67.7	71.1	74.9	77.4	79.0	79.2	80.0	80.7	80.8	79.8	77.8	75.1	73.1	71.5	70.5	69.4	72.7
Key West, Fla	80.7	80.5	80.5	80.6	80.6	80.6	80.9	82.3	83.0	84.1	84.6	85.3	85.4	85.2	85.2	84.8	83.7	83.1	82.4	82.1	81.8	81.8	81.5	81.0	82.6
Marquette, Mich	57.4	56.8	56.1	55.6	54.9	55.0	55.1	56.3	58.3	60.6	62.3	63.6	64.7	66.0	65.8	65.9	65.1	64.1	62.5	60.5	60.0	59.0	58.4	57.7	60.1
Memphis, Tenn	74.1	73.1	72.7	71.9	71.0	70.3	69.9	70.9	72.6	75.1	78.2	80.1	81.8	82.4	82.6	83.1	83.2	83.0	81.3	79.2	77.6	76.2	75.0	74.2	76.6
New Orleans, La	78.1	77.6	77.4	77.2	76.9	76.5	76.2	77.6	79.5	81.4	83.4	84.0	85.6	85.1	85.5	85.3	85.3	84.4	83.0	81.1	80.2	79.1	78.6	77.9	80.7
New York, N Y	66.8	66.2	65.8	65.4	64.8	64.3	64.7	65.8	67.2	69.4	71.6	73.4	74.7	75.5	75.7	75.8	74.7	73.4	72.0	70.8	69.6	68.6	67.7	66.9	69.6
Philadelphia, Pa	67.7	66.9	66.6	65.8	65.1	64.8	65.3	67.1	69.3	71.8	74.4	76.2	77.8	78.8	79.2	78.9	78.0	75.7	73.3	71.5	70.2	69.3	68.3	67.4	71.2
Pittsburg, Pa	67.1	66.5	65.6	65.2	64.7	64.1	63.9	66.0	68.3	71.2	73.2	75.6	77.2	77.7	77.8	77.8	76.7	75.9	74.4	72.9	71.2	69.7	68.6	67.4	70.8
Portland, Oreg	56.6	55.8	54.4	53.7	52.9	52.1	51.4	51.2	50.2	50.9	52.4	54.0	56.6	58.4	60.7	62.0	63.5	64.0	63.7	63.4	61.5	60.0	58.6	57.7	56.9
Rapid City, S. Dak	56.4	55.5	54.1	53.9	53.1	52.8	51.8	52.2	55.1	60.6	64.2	66.8	69.3	71.2	72.8	73.7	73.7	72.5	71.1	67.3	63.7	61.4	58.3	56.4	62.0
St. Louis, Mo	70.6	69.8	69.2	68.3	67.2	66.6	66.1	66.5	68.1	70.8	73.9	77.0	79.0	80.2	81.1	81.8	81.7	80.8	79.4	77.0	75.3	73.7	72.1	71.2	73.6
St. Paul, Minn	61.3	60.7	60.0	59.3	58.7	58.0	57.0	57.0	59.2	61.7	64.2	66.5	68.0	69.4	70.8	71.9	72.7	72.3	70.3	68.0	65.8	64.0	63.0	62.1	64.3
Salt Lake City, Utah	61.3	60.3	59.5	58.5	58.1	57.1	56.3	56.0	56.6	59.3	63.8	67.2	69.3	71.1	72.2	72.8	73.2	73.1	72.4	70.9	67.5	65.0	63.3	61.7	64.4
San Diego, Cal	64.2	63.8	63.2	63.0	63.0	62.8	62.8	62.6	62.9	63.8	65.6	67.9	70.7	71.2	71.9	72.3	72.6	72.3	71.3	70.1	68.1	66.9	66.0	65.3	66.8
San Francisco, Cal	57.6	57.2	57.1	56.7	56.4	56.2	55.9	55.7	55.3	56.3	57.9	59.8	61.6	63.7	65.1	65.7	66.0	64.9	63.4	62.0	60.4	59.6	58.9	57.9	59.6
Santa Fe, N. Mex	60.4	59.5	57.9	57.2	56.2	54.8	54.0	53.7	57.1	61.0	63.5	66.2	68.4	70.5	71.8	72.9	73.3	72.9	71.9	69.6	65.2	63.7	62.1	60.9	63.5
Savannah, Ga	73.9	73.2	72.7	72.0	71.6	71.1	71.8	74.4	78.1	81.0	83.0	84.0	84.9	84.9	83.7	83.0	81.4	79.7	77.6	76.6	75.7	75.3	74.6	74.0	77.4
Washington, D. C	67.6	66.6	65.7	64.7	63.9	63.2	64.6	67.7	71.3	74.2	76.4	78.4	78.9	81.2	81.1	80.8	79.5	77.2	74.0	71.4	69.9	68.7	68.0	67.3	71.8

TABLE V.—*Mean pressure for each hour of seventy-fifth meridian time, September, 1895.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Bismarck, N. Dak	28.151	.151	.153	.154	.155	.153	.157	.160	.161	.164	.158	.147	.135	.117	.099	.086	.081	.078	.081	.086	.103	.118	.130	.142	.130
Boston, Mass	29.896	.887	.893	.896	.906	.915	.917	.926	.926	.915	.906	.896	.884	.877	.869	.867	.872	.878	.887	.893	.898	.899	.895	.895	.895
Buffalo, N. Y	29.287	.284	.282	.282	.290	.300	.310	.305	.315	.315	.311	.304	.294	.283	.276	.271	.268	.269	.275	.279	.285	.287	.286	.282	.289
Chicago, Ill	29.132	.131	.135	.135	.142	.149	.160	.165	.170	.169	.164	.160	.144	.130	.117	.111	.101	.099	.101	.105	.117	.122	.128	.130	.134
Cincinnati, Ohio	29.406	.404	.404	.408	.415	.425	.440	.446	.452	.455	.447	.436	.430	.408	.387	.377	.373	.373	.374	.384	.393	.400	.405	.409	.410
Cleveland, Ohio	29.241	.240	.242	.246	.253	.265	.278	.287	.280	.290	.288	.278	.265	.247	.238	.231	.230	.230	.234	.240	.241	.239	.240	.236	.253
Detroit, Mich	29.251	.251	.252	.253	.257	.266	.277	.284	.294	.294	.289	.282	.271	.256	.244	.233	.227	.227	.234	.239	.248	.251	.253	.252	.258
Dodge City, Kans	27.389	.392	.398	.386	.387	.389	.398	.410	.420	.426	.432	.425	.413	.394	.375	.357	.346	.341	.340	.344	.359	.375	.382	.384	.385
Eastport, Me	29.897	.897	.900	.905	.900	.916	.918	.922	.920	.908	.895	.885	.874	.866	.861	.861	.865	.871	.882	.891	.896	.898	.897	.900	.893
Galveston, Tex	30.005	.000	.996	.992	.996	.008	.012	.022	.031	.040	.044	.041	.029	.012	.997	.985	.981	.981	.985	.989	.001	.010	.012	.009	.007
Havre, Mont	27.289	.286	.288	.286	.284	.284	.287	.291	.295	.302	.305	.305	.298	.290	.280	.269	.264	.261	.262	.264	.272	.279	.286	.289	.284
Kansas City, Mo	29.001	.003	.003	.005	.011	.016	.028	.035	.042	.044	.039	.037	.028	.012	.998	.982	.976	.973	.971	.975	.985	.994	.999	.002	.007
Key West, Fla	29.982	.972	.962	.958	.963	.974	.987	.998	.006	.013	.008	.998	.983	.963	.944	.937	.940	.945	.957	.973	.984	.988	.986	.981	.975
Marquette, Mich	29.108	.113	.113	.115	.119	.123	.129	.130	.128	.129	.126	.115	.106	.095	.084	.085	.085	.085	.085	.090	.096	.100	.102	.096	.107
Memphis, Tenn	29.638	.636	.637	.637	.643	.650	.663	.672	.685	.692	.693	.687	.672	.650	.634	.621	.614	.611	.613	.618	.630	.640	.644	.641	.647
New Orleans, La	29.982	.979	.974	.974	.978	.987	.997	.010	.019	.026	.025	.020	.002	.983	.969	.961	.954	.957	.961	.969	.983	.989	.991	.986	.986
New York, N Y	29.715	.712	.711	.712	.720	.731	.738	.745	.747	.746	.736	.728	.712	.702	.694	.690	.691	.694	.700	.707	.716	.720	.721	.720	.717
Philadelphia, Pa	29.940	.937	.933	.937	.944	.952	.964	.971	.977	.970	.964	.950	.934	.921	.910	.907	.909	.912	.925	.935	.941	.944	.945	.945	.940
Pittsburg, Pa	29.176	.177	.175	.179	.182	.190	.201	.212	.215	.214	.208	.198	.185	.173	.161	.153	.150	.149	.151	.157	.163	.167	.173	.175	.179
Portland, Oreg	29.868	.868	.868	.867	.866	.865	.865	.870	.879	.886	.891	.896	.894	.887	.879	.868	.856	.850	.845	.842	.845	.853	.859	.863	.868
St. Louis, Mo	29.455	.459	.460	.464	.472	.481	.492	.500	.504	.509	.505	.498	.481	.462	.446	.434	.427	.424	.424	.431	.442	.451	.455	.456	.464
St. Paul, Minn	29.011	.009	.009	.004	.007	.014	.022	.029	.027	.030	.029	.026	.016	.002	.988	.977	.967	.963	.967	.978	.994	.998	.004	.007	.008
Salt Lake City, Utah	25.638	.632	.641	.644	.643	.645	.651	.660	.669	.677	.683	.684	.677	.666	.650	.638	.624	.616	.609	.602	.600	.610	.617	.623	.641
San Diego, Cal	29.847	.848	.844	.838	.832	.830	.828	.832	.840	.855	.862	.866	.864	.853	.839	.826	.815	.810	.807	.808	.813	.824	.836	.840	.836
San Francisco, Cal	29.818	.818	.812	.813	.810	.806	.808	.811	.824	.836	.847	.854	.858	.855	.844	.832	.822	.809	.800	.795	.793	.797	.808	.813	.820
Santa Fe, N. Mex	23.375	.376	.378	.378	.378	.380	.383	.393	.399	.405	.410	.412	.404	.392	.376	.362	.351	.342	.337	.337	.340	.354	.362	.368	.375
Savannah, Ga	29.971	.965	.958	.959	.966	.978	.992	.997	.010	.013	.006	.995	.976	.960	.947	.939	.940	.945	.953	.966	.972	.979	.979	.974	.972
Washington, D. C	29.956	.952	.954	.956	.963	.972	.981	.987	.990	.996	.984	.980	.966	.948	.934	.924	.924	.930	.940	.950	.959	.963	.964	.962	.960

TABLE VI.—*Average wind movement for each hour of seventy-fifth meridian time, September*, 1895.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Abilene, Tex.	7.4	8.4	8.8	8.4	8.0	7.2	7.1	7.0	8.9	10.9	12.0	11.7	11.7	11.5	11.6	10.9	10.6	11.0	10.2	8.2	6.5	6.2	6.1	6.8	9.0
Albany, N. Y.	5.1	4.8	4.8	4.5	4.8	5.5	5.7	6.8	7.6	8.2	8.4	8.7	9.1	9.9	10.1	9.0	8.9	7.4	6.0	6.0	5.5	5.6	5.4	5.3	6.8
Alpena, Mich.	7.8	7.2	7.3	7.4	7.4	7.4	7.0	7.5	9.0	10.8	11.8	12.2	13.3	14.4	14.8	14.2	13.0	13.1	10.1	8.4	7.8	7.8	8.0	7.3	9.8
Amarillo, Tex.	18.6	19.6	19.4	17.7	17.5	16.3	14.9	15.2	15.3	19.6	21.9	21.4	21.7	21.4	20.6	20.6	20.7	20.3	20.5	18.8	16.1	16.5	17.5	17.5	18.7
Atlanta, Ga.	6.5	6.7	6.9	7.1	6.5	6.2	6.2	6.0	6.5	6.7	7.1	7.0	7.3	7.7	8.1	8.3	8.9	8.0	6.3	6.5	6.7	7.0	7.6	7.3	7.0
Augusta, Ga.	3.1	2.7	2.6	2.2	2.6	2.2	2.8	2.9	4.1	4.9	5.1	5.1	5.9	5.9	6.4	6.6	6.8	6.0	4.9	3.8	3.6	3.5	3.3	3.2	4.2
Baker City, Oreg.	3.7	4.1	4.4	4.7	4.9	4.6	5.4	4.7	5.0	5.0	5.0	3.7	3.5	4.6	4.6	5.4	5.9	5.8	5.5	5.5	4.6	3.2	3.5	4.4	4.7
Baltimore, Md.	4.9	4.9	4.9	5.2	5.1	5.1	5.3	5.6	6.7	7.8	8.4	8.9	9.1	9.6	9.9	9.9	9.2	8.1	6.6	5.7	5.4	5.1	5.3	5.3	6.7
Bismarck, N. Dak.	9.4	9.1	8.1	7.4	7.7	7.5	6.8	7.3	7.6	9.8	12.4	14.4	16.5	17.4	17.4	17.7	16.5	15.6	14.0	12.0	9.6	9.7	9.4	8.9	11.3
Block Island, R. I.	11.4	11.3	11.1	11.7	12.1	11.9	13.1	13.4	14.1	13.9	13.3	13.1	13.1	13.9	13.6	13.4	13.1	12.7	12.7	13.2	13.5	12.5	12.3	11.7	12.8
Boston, Mass.	8.7	8.7	8.8	8.7	8.8	8.2	7.6	8.3	9.5	10.0	11.1	11.5	11.5	11.4	12.0	11.9	11.4	10.6	10.2	10.1	9.2	9.2	9.1	8.7	9.8
Buffalo, N. Y.	8.1	7.9	8.2	8.1	7.9	8.8	7.7	7.8	8.6	9.4	10.4	10.0	12.0	12.6	12.0	11.1	11.1	9.8	9.2	8.5	8.4	7.6	7.7	7.8	9.2
Cairo, Ill.	6.3	6.3	6.3	5.8	5.6	5.6	5.4	6.0	7.6	7.4	7.4	7.8	8.4	8.8	9.1	8.8	8.8	7.5	5.9	5.9	5.7	5.4	4.9	4.9	6.7
Cape Henry, Va.	11.7	11.4	10.4	9.8	9.8	10.3	11.0	11.8	12.3	12.6	12.5	12.5	13.0	12.7	12.6	12.9	12.4	11.1	10.6	11.4	11.4	11.2	11.9	12.1	11.6
Charleston, S. C.	6.0	5.8	5.9	5.5	5.7	5.8	6.4	7.1	7.6	7.8	8.0	8.3	8.5	9.6	10.6	10.9	10.3	9.6	8.3	7.7	7.4	7.0	7.2	6.6	7.7
Charlotte, N. C.	4.4	4.4	4.5	4.2	4.0	4.3	4.3	4.6	5.5	5.9	5.9	5.7	5.9	6.2	6.1	5.8	5.1	4.5	4.5	5.2	5.2	5.3	5.5	5.0	5.1
Chattanooga, Tenn.	3.9	3.3	3.3	3.2	3.7	3.8	3.3	3.2	4.4	5.8	6.1	6.3	7.0	6.4	6.7	6.4	7.3	6.8	5.0	4.3	4.0	3.8	3.9	3.6	4.8
Cheyenne, Wyo.	7.8	7.8	7.3	7.0	6.9	7.5	6.2	6.5	6.5	8.3	12.1	12.9	13.2	14.7	14.9	15.4	15.6	14.7	14.1	13.1	9.9	8.2	8.1	7.9	10.3
Chicago, Ill.	18.4	19.0	18.4	18.6	19.1	18.7	18.4	17.7	17.4	18.3	19.2	20.3	21.2	20.4	20.6	20.7	20.4	19.6	17.7	16.4	15.9	16.6	18.1	18.5	18.7
Cincinnati, Ohio.	5.1	5.4	4.8	4.7	4.8	4.9	4.7	5.4	6.4	8.0	8.5	9.0	9.3	9.6	9.2	9.7	9.7	9.5	7.6	6.4	5.4	5.0	5.2	5.8	6.8
Cleveland, Ohio	12.5	12.6	12.7	13.1	12.9	12.8	12.1	11.5	12.2	13.2	13.5	13.6	13.6	14.4	13.8	13.2	11.3	10.7	9.8	9.6	10.6	10.8	11.2	12.7	12.3
Columbia, Mo.	6.7	7.0	7.2	7.3	7.0	7.1	6.8	7.0	7.8	9.1	10.3	10.7	11.2	11.1	11.3	11.7	11.4	10.8	9.6	8.1	7.1	6.8	6.7	6.7	8.6
Columbus, Ohio	5.1	5.1	4.8	4.6	4.3	3.8	3.9	4.8	5.5	7.1	7.2	7.2	7.2	8.1	8.1	8.1	8.1	7.7	6.8	5.9	5.9	5.3	5.0	5.2	6.0
Concordia, Kans.	8.6	8.2	8.0	7.7	7.2	6.7	6.8	7.1	8.1	8.9	9.9	10.1	10.3	11.5	11.5	12.0	11.5	11.8	10.5	8.3	7.1	7.9	8.7	9.1	9.1
Corpus Christi, Tex.	11.7	10.6	8.4	7.1	6.6	6.2	6.1	6.3	7.5	9.1	10.4	11.9	13.7	15.4	16.1	17.0	16.2	15.9	15.6	14.7	14.1	13.6	13.4	12.0	11.6
Davenport, Iowa.	8.3	8.3	7.9	7.6	7.1	7.3	7.5	7.3	8.3	9.5	11.2	12.4	12.3	12.7	12.7	13.2	13.0	11.7	10.0	7.7	7.3	7.7	8.3	8.2	9.5
Denver, Colo.	7.4	6.9	6.8	6.7	6.5	6.1	5.9	5.7	6.5	6.4	5.9	5.9	6.4	6.7	7.0	7.6	8.3	9.1	8.1	7.8	6.8	5.6	5.7	6.3	6.8
Des Moines, Iowa.	8.1	8.0	7.1	6.8	7.5	7.5	7.6	8.0	9.5	11.3	12.9	13.9	14.1	14.3	13.9	14.3	13.6	12.5	10.4	8.6	7.9	8.6	8.8	8.4	10.1
Detroit, Mich.	9.0	9.5	10.0	9.4	8.3	8.7	8.9	9.0	9.8	11.5	12.2	12.4	13.2	13.0	13.1	13.4	13.4	13.4	8.9	8.9	8.9	9.2	9.6	9.3	10.5
Dodge City, Kans.	13.3	13.3	12.9	12.2	11.4	10.3	10.7	11.4	12.5	16.5	17.4	18.7	19.7	19.6	18.9	19.2	19.2	19.4	17.8	14.8	13.2	12.5	12.9	12.9	15.0
Duluth, Minn.	10.1	10.1	9.5	9.1	8.7	8.6	7.9	8.4	9.4	10.5	11.2	11.7	13.3	13.6	13.8	13.7	12.6	10.7	10.0	10.6	11.3	10.7	11.0	10.1	10.7
Eastport, Me.	7.3	6.9	8.4	7.4	7.7	7.8	7.6	9.3	10.1	9.8	10.4	10.7	11.1	11.5	10.9	9.9	9.5	9.2	8.1	8.6	7.7	7.7	7.7	7.8	8.9
El Paso, Tex.	9.6	10.4	10.1	10.2	10.2	9.8	9.6	9.1	9.1	8.5	10.8	10.6	10.7	10.0	10.1	11.1	11.7	11.5	11.1	10.7	10.2	8.8	8.6	8.9	10.1
Erie Pa.	10.4	10.0	10.4	10.9	10.6	9.8	9.9	9.6	10.4	10.7	10.8	11.2	11.7	11.3	11.3	10.8	9.6	8.2	7.9	8.4	8.8	8.9	9.8	9.8	10.1
Eureka, Cal.	4.3	4.1	3.7	3.7	3.2	3.1	2.7	2.8	2.8	2.8	3.3	4.1	5.7	7.1	8.6	8.7	9.4	9.9	9.1	8.8	7.4	6.3	5.1	4.6	5.5
Fort Canby, Wash.	11.2	10.5	10.2	10.9	9.8	8.7	8.0	8.5	8.7	10.1	9.1	10.8	10.9	11.4	12.7	12.2	12.0	11.9	12.1	11.2	10.9	10.8	11.2	11.0	30.6
Fort Smith, Ark.	5.3	5.7	5.4	5.8	5.7	5.4	5.1	5.2	5.8	6.3	6.8	7.4	7.7	8.2	8.2	8.2	8.2	8.2	6.0	4.5	4.4	5.1	4.7	5.4	6.2
Fresno, Cal.	7.1	7.6	6.9	6.2	5.7	5.1	5.1	4.7	4.3	4.4	4.4	4.8	5.3	5.3	5.1	5.4	5.2	5.4	5.5	5.6	5.6	5.9	6.7	6.9	5.6
Galveston, Tex.	9.4	9.2	9.3	9.2	9.2	8.8	9.0	8.4	8.6	9.8	10.0	10.3	11.0	10.5	10.7	11.2	10.6	10.8	9.9	9.7	10.1	9.9	9.7	9.8	9.8
Grand Haven, Mich.	10.6	10.4	10.5	10.7	10.6	10.5	10.4	10.7	11.3	12.6	12.9	13.4	13.5	13.9	14.0	13.5	13.1	11.7	10.6	10.2	9.9	10.2	10.8	11.2	11.6
Green Bay, Wis.	8.5	8.4	8.2	7.8	7.7	7.8	7.8	8.4	10.1	11.1	12.2	13.0	13.2	13.7	14.0	13.0	12.6	11.6	9.2	8.0	8.0	7.4	7.9	8.4	9.9
Hannibal, Mo.	8.5	9.4	8.6	8.2	8.6	8.4	9.0	8.5	10.1	11.8	12.4	12.2	12.5	12.9	12.7	12.4	12.2	10.8	9.1	7.8	7.8	8.0	8.1	8.0	9.9
Harrisburg, Pa.	3.8	3.7	3.2	3.2	3.7	3.7	4.4	5.1	5.6	7.1	6.5	6.8	7.5	8.4	8.1	8.5	8.3	6.7	5.3	5.2	4.5	4.6	4.0	3.6	5.5
Hatteras, N. C.	8.8	9.6	10.2	10.4	10.2	10.2	9.9	9.7	10.5	10.9	11.3	11.7	11.9	12.1	12.0	11.5	10.9	10.3	9.8	9.8	10.2	9.7	9.4	9.4	10.4
Havre, Mont.	7.7	7.9	7.9	7.9	7.7	8.5	8.4	7.5	8.0	10.0	11.8	12.9	13.6	13.8	13.8	15.0	15.1	13.6	13.3	10.7	8.2	7.7	7.6	7.9	10.3
Helena, Mont.	7.9	7.3	6.4	6.7	6.7	6.8	6.3	6.4	6.5	6.0	6.7	7.5	8.2	9.1	10.3	10.2	10.6	11.2	11.2	10.5	9.1	9.4	9.3	8.4	8.3
Huron, S. Dak.	11.1	11.2	11.3	11.3	11.3	11.9	11.5	11.3	12.6	15.6	17.2	18.1	18.9	19.9	19.8	19.4	19.4	18.6	17.4	14.8	13.7	13.4	13.1	12.4	14.8
Idaho Falls, Idaho.	7.8	7.6	7.2	7.1	7.0	7.6	7.5	7.3	8.2	9.7	9.8	9.8	10.4	10.7	10.6	11.5	12.3	12.0	11.3	10.7	9.1	7.8	8.4	8.5	9.2
Independence, Cal.	7.9	7.8	8.2	8.1	7.9	7.5	6.5	6.6	7.3	6.4	6.7	7.1	7.4	6.9	7.5	10.1	12.1	12.2	12.0	12.9	11.7	11.0	9.7	8.4	8.7
Indianapolis, Ind.	4.0	4.2	4.6	4.3	4.2	3.9	3.9	4.2	5.9	6.8	7.0	7.2	7.8	7.8	7.8	7.4	7.0	6.2	4.9	4.6	4.8	4.2	4.3	3.9	5.5
Jacksonville, Fla.	3.9	3.9	3.9	4.2	4.3	4.6	4.4	4.0	5.7	6.7	8.0	9.1	9.6	10.3	10.2	10.5	9.5	8.2	6.4	5.6	4.6	4.3	3.9	4.0	6.2
Jupiter, Fla.	8.2	8.0	7.6	7.4	7.7	7.1	7.0	7.3	7.9	8.7	10.1	10.9	11.2	11.5	11.3	11.0	10.9	10.0	9.4	9.2	8.5	8.5	8.4	9.2	9.0
Kansas City, Mo.	10.0	10.2	9.8	8.9	8.1	8.3	8.0	8.8	10.0	11.2	12.9	13.2	13.8	13.1	13.3	13.5	13.1	11.4	10.0	8.8	8.6	8.8	9.5	9.6	10.5
Keokuk, Iowa.	7.8	7.4	7.1	7.0	6.8	7.2	7.0	7.3	8.7	9.7	10.2	10.2	10.4	11.1	10.9	11.5	11.4	10.8	8.5	7.1	7.3	7.5	7.6	7.7	8.7
Key West, Fla.	7.0	6.8	6.3	5.5	5.8	5.7	6.0	6.5	7.2	7.6	8.0	8.4	8.5	8.3	7.6	8.0	7.9	7.5	8.1	7.7	8.5	8.0	7.9	7.4	7.4
Kittyhawk, N. C.	12.2	12.3	12.0	11.8	11.4	11.6	11.6	12.5	13.6	13.8	13.5	13.9	14.3	14.1	13.7	13.9	14.0	13.5	13.1	12.7	12.6	12.1	11.6	11.0	12.8
Knoxville, Tenn.	1.9	2.1	2.4	2.3	2.2	2.3	2.7	3.2	4.5	4.7	5.1	5.1	5.5	5.7	5.7	5.9	6.0	5.8	4.2	2.8	2.3	2.1	2.3	2.4	3.7
La Crosse, Wis.	7.7	7.1	7.4	7.9	8.5	7.9	7.1	6.6	7.3	8.3	9.2	9.6	10.3	11.2	11.1	11.3	10.6	9.3	8.5	8.2	7.6	7.2	7.9	7.4	8.6
Lander, Wyo.	3.7	3.8	3.4	3.2	3.1	2.5	2.3	2.2	2.0	2.9	3.4	3.4	4.6	5.8	7.4	8.1	9.3	9.0	7.8	6.8	6.3	5.4	5.4	4.2	4.8
Lexington, Ky.	9.6	10.1	10.0	9.8	10.3	9.9	9.8	8.9	9.9	11.4	11.8	11.1	11.7	11.8	12.1	11.7	12.2	11.0	9.1	8.5	8.4	9.6	9.1	8.7	10.3
Little Rock, Ark.	4.3	4.2	4.6	3.9	3.9	3.9	3.7	4.2	5.2	6.2	6.9	6.7	7.6	8.5	8.5	8.3	8.2	8.4	6.2	4.3	3.9	4.0	4.1	3.7	5.6
Los Angeles, Cal.	2.1	2.1	1.8	2.2	2.0	1.8	1.6	1.8	1.7	2.0	2.5	2.4	2.8	3.3	4.6	5.5	6.6	6.8	6.7	6.1	4.7	3.1	2.8	2.2	3.3
Louisville, Ky.	5.1	5.6	5.4	5.1	5.7	5.6	5.0	5.4	6.9	6.6	7.9	8.7	8.8	9.1	9.2	9.5	10.0	9.3	7.3	6.0	5.5	5.3	5.5	5.2	6.8
Lynchburg, Va.	1.9	1.5	1.6	1.7	1.3	1.2	1.5	2.4	4.2	4.7	5.7	6.0	6.0	5.5	5.6	6.7	6.5	6.2	4.6	3.1	2.4	1.6	1.9	1.7	3.6
Marquette, Mich.	12.5	12.3	12.4	12.5	11.5	12.8	12.3	13.6	14.3	14.6	14.8	15.5	14.7	15.7	14.7	13.4	12.2	11.1	9.3	8.7	10.4	11.8	11.9	12.6	12.7
Memphis, Tenn.	7.9	7.5	7.6	7.9	7.3	7.2	6.9	6.6	7.0	7.1	7.6	8.5	8.9	9.5	9.5	9.4	8.9	8.5	7.0	5.9	6.4	6.9	7.3	7.9	7.7
Meridian, Miss.	2.0	1.8	1.8	1.9	1.6	1.8	2.5	2.4	4.0	5.8	6.2	6.5	7.2	7.4	6.6	6.8	6.4	5.7	3.9	3.2	2.7	2.5	2.7	2.3	4.0
Miles City, Mont.	5.4	5.3	5.7	5.9	5.2	5.9	5.5	4.6	4.0	5.5	6.9	8.1	10.5	11.0	11.1	11.2	10.9	9.9	9.9	7.9	6.4	6.3	5.5	5.2	7.3
Milwaukee, Wis.	8.9	10.1	10.6	10.4	10.4	9.9	9.6	10.1	11.2	11.8	12.7	12.6	13.5	14.3	15.0	15.0	14.4	13.1	10.5	9.1	9.1	8.7	9.2	9.3	11.2
Mobile, Ala.	3.9	4.0	3.8	4.1	4.3	4.9	4.9	5.2	5.9	6.9	7.4	7.5	8.3	8.5	9.5	9.7	10.4	9.4	7.3	6.4	5.8	5.3	4.9	4.8	6.4
Montgomery, Ala.	3.1	3.4	3.2	3.2	3.3	3.4	2.9	3.4	5.0	5.7	6.0	6.0	6.4	7.0	7.4	7.5	7.3	6.5	5.1	4.6	5.0	4.4	3.9	3.6	4.9
Moorhead, Minn.	9.8	9.7	10.1	10.4	9.8	9.8	10.5	10.0	11.0	12.2	13.2	13.5	14.0	14.6	15.4	16.3	15.6	15.5	13.5	11.7	11.1	10.7	10.7	10.7	12.1
Nantucket, Mass.	7.3	7.8	7.7	7.7	8.0	7.8	8.6	9.3	9.5	10.1	10.4	10.1	10.2	10.4	10.2	9.5	8.8	8.2	7.8	8.1	8.5	8.1	8.0	7.7	8.7
Nashville, Tenn.	3.7	3.5	3.8	3.7	3.3	3.5	3.6	4.1	4.9	5.8	6.4	6.8	7.1	6.7	7.1	7.5	7.2	7.2	6.1	5.1	4.2	3.9	3.8	3.4	5.1
New Haven, Conn.	6.3	6.5	6.7	6.0	6.1	6.7	6.7	7.1	8.6	9.7	9.9	10.4	11.3	11.8	11.7	11.4	10.6	8.7	8.1	7.4	6.6	6.5	6.8	6.4	8.3
New London, Conn.	5.4	5.3	4.9	4.8	4.8	4.9	5.3	6.3	6.4	7.2	8.1	9.0	9.2	9.5	9.8	9.1	8.1	7.5	6.4	5.1	5.4	4.5	4.3	5.0	6.5
New Orleans, La.	4.5	4.3	4.5	4.2	4.2	4.0	4.5	5.1	6.5	7.9	8.6	8.9	8.7	9.3	8.7	8.5	8.3	7.5	6.8	6.5	6.3	5.1	5.7	5.5	6.4
New York, N. Y.	11.3	10.4	9.5	9.5	10.1	10.2	10.3	10.0	10.0	10.5	10.4	10.2	10.9	11.5	11.9	12.7	13.6	12.3	12.6	13.3	13.6	12.8	12.0	12.4	11.3
Norfolk, Va.	6.4	5.6	5.8	5.4	5.3	4.8	5.6	6.6	7.9	7.9	8.1	7.9	8.2	8.1	8.4	8.9	9.1	7.8	7.0	6.0	6.2	6.3	6.8	6.8	6.9
Northfield, Vt.	6.3	6.3	6.0	6.2	5.2	4.8	5.7	6.3	6.9	7.9	10.8	11.6	10.9	11.2	10.4	9.8	8.8	7.0	7.4	7.2	7.3	7.3	6.9	6.3	7.7
North Platte, Nebr.	8.3	9.1	8.8	7.7	7.5	6.6	6.6	6.3	6.7	8.4	10.8	11.0	10.6	12.1	11.9	12.0	11.8	10.4	10.2	9.7	9.2	9.0	8.5	9.3	9.3
Oklahoma, Okla.	8.6	8.5	8.1	7.6	7.2	7.2	7.5	7.9	8.4	9.7	11.1	11.3	11.4	12.2	12.1	12.2	11.9	11.2	10.2	8.7	7.9	8.5	8.5	8.6	9.4
Omaha, Nebr.	8.7	7.6	7.5	7.5	7.0	7.0	6.5	6.6	7.6	9.4	10.5	11.3	11.5	12.3	13.3	13.3	13.5	12.3	10.9	8.4	8.3	8.8	8.9	8.8	9.5
Oswego, N. Y.	9.5	9.8	10.1	10.5	9.7	10.4	9.9	10.1	10.0	10.4	10.1	9.6	9.5	10.0	9.7	9.5	8.4	7.5	7.6	8.6	9.4	9.7	9.5	9.6	9.5
Palestine, Tex.	5.7	5.2	4.7	4.9	4.7	4.5	4.2	3.9	5.7	7.1	7.3	7.7	7.8	7.5	7.5	7.4	7.9	7.4	6.2	4.5	5.2	5.9	6.1	5.7	6.0

TABLE VI.—*Average wind movement, etc.*—Continued.

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Mean.
Parkersburg, W. Va.	3.2	3.5	3.6	3.3	3.7	3.7	3.2	3.6	4.7	5.3	6.3	6.4	7.3	7.8	7.6	7.5	7.5	6.3	4.8	4.0	3.7	4.1	3.7	3.4	4.9
Pensacola, Fla.	5.5	5.5	6.6	6.4	6.6	6.5	6.7	7.1	7.7	8.1	8.4	8.8	9.6	9.6	10.1	9.6	9.8	8.6	7.5	5.7	5.6	5.2	5.4	5.9	7.4
Philadelphia, Pa.	6.7	6.7	7.1	7.1	6.9	7.0	7.8	9.3	10.2	10.6	11.1	11.1	11.8	12.1	12.0	12.1	11.6	11.1	10.2	10.2	9.1	8.4	8.0	7.4	9.4
Phœnix, Ariz.	2.9	3.6	3.4	3.1	3.0	3.1	2.8	3.3	3.9	4.2	5.0	5.8	5.4	4.7	4.7	5.1	5.1	5.4	5.5	4.6	4.3	3.8	3.0	3.7	4.1
Pierre, S. Dak.	8.8	7.4	7.8	7.5	7.5	7.3	6.8	6.7	7.1	7.8	9.3	11.8	12.1	13.2	12.9	13.2	13.1	13.0	12.2	10.9	10.1	10.1	11.0	9.6	9.9
Pittsburg, Pa.	4.5	4.6	4.5	4.0	4.4	4.6	4.8	5.1	5.3	6.5	6.9	7.2	8.3	8.3	8.4	8.9	8.2	7.5	6.0	5.4	4.9	4.9	5.3	4.6	6.0
Port Angeles, Wash.	4.5	5.2	5.1	5.4	5.2	5.5	5.5	5.7	5.9	5.0	4.0	3.9	4.9	5.4	5.3	5.9	6.3	6.5	5.9	5.9	5.4	5.0	4.7	4.4	5.3
Port Huron, Mich.	9.4	9.4	8.8	9.2	9.2	9.0	9.2	9.5	10.8	11.6	13.4	13.8	14.3	14.3	14.5	13.9	13.1	10.9	10.3	10.2	9.3	10.1	10.1	9.1	11.0
Portland, Me.	6.4	6.2	5.2	5.4	4.9	5.1	5.1	5.7	6.3	6.8	7.5	8.2	8.6	9.1	9.3	9.6	8.3	7.1	6.7	6.8	6.4	6.2	6.5	6.2	6.8
Portland, Oreg.	7.4	6.8	6.8	6.1	6.5	6.5	6.6	6.8	6.6	6.2	6.3	7.7	8.5	8.9	8.4	8.8	9.0	9.6	10.3	9.9	9.2	9.1	8.9	8.1	7.9
Pueblo, Colo.	5.7	5.6	4.9	5.9	5.6	4.9	4.5	4.7	4.9	4.5	6.0	7.4	7.1	7.8	9.1	9.4	9.5	10.4	9.5	8.2	8.3	7.4	5.6	5.7	6.8
Raleigh, N. C.	3.5	3.9	3.7	3.8	3.7	3.5	3.5	4.4	5.4	6.0	5.8	6.3	5.8	5.8	5.2	5.5	5.3	4.0	3.0	3.6	3.5	3.5	3.8	4.0	4.4
Rapid City, S. Dak.	9.1	10.1	9.2	9.0	9.5	9.9	9.9	9.7	9.7	9.2	10.3	12.1	12.9	13.1	14.4	14.0	14.0	13.6	11.9	8.8	7.9	7.7	8.0	9.1	10.6
Red Bluff, Cal.	5.0	4.9	4.8	5.0	5.2	5.2	5.0	5.2	4.9	5.3	5.7	6.6	7.0	6.9	6.8	7.2	7.0	6.8	6.6	6.5	6.1	6.0	5.3	5.0	5.8
Rochester, N. Y.	5.6	6.0	6.3	5.9	6.0	5.8	6.0	6.4	6.9	7.8	8.2	8.4	9.3	9.5	9.8	9.5	8.4	7.5	5.8	5.9	5.4	5.5	5.6	6.2	7.0
Roseburg, Oreg.	2.0	1.8	1.9	1.9	1.8	2.0	1.6	1.5	1.5	1.7	1.8	2.3	3.4	3.7	4.0	4.4	4.8	6.2	6.2	6.0	5.4	3.7	2.4	1.9	3.1
Sacramento, Cal.	8.4	8.1	8.9	9.2	9.1	8.9	8.6	8.8	8.5	8.2	7.8	7.4	8.2	8.6	8.8	9.0	8.7	8.4	8.5	8.9	8.8	8.9	9.5	9.2	8.6
St. Louis, Mo.	9.9	9.7	9.2	8.4	9.1	9.0	8.5	9.1	9.8	10.7	11.2	11.1	11.0	11.6	12.0	11.9	11.9	11.7	10.3	8.9	9.4	9.7	9.5	9.8	10.2
St. Paul, Minn.	8.2	7.8	7.7	7.1	6.3	6.0	6.1	6.3	7.3	8.1	9.8	9.7	10.3	10.8	11.1	10.5	10.1	9.9	9.2	7.6	7.4	7.9	8.1	8.1	8.4
St. Vincent, Minn.	6.3	7.0	7.0	6.8	6.8	6.9	6.7	7.0	8.3	9.6	10.7	10.7	10.9	11.8	13.1	13.2	12.8	12.3	10.1	7.7	7.1	6.6	6.6	7.0	8.9
Salt Lake City, Utah.	5.6	5.7	5.4	4.9	5.7	5.8	5.7	5.5	5.0	4.8	4.7	5.8	8.4	9.3	10.8	11.7	11.0	12.2	10.3	9.2	7.0	5.3	5.7	5.9	7.1
San Antonio, Tex.	7.0	5.9	5.2	4.7	4.7	4.9	5.0	4.6	5.4	7.4	8.4	8.6	8.7	9.1	8.7	8.8	9.4	9.6	10.0	9.5	9.1	9.6	9.5	8.8	7.6
San Diego, Cal.	2.2	2.3	2.3	2.8	3.0	2.9	2.8	2.4	2.9	2.4	3.2	4.1	5.9	7.9	9.6	9.7	9.9	9.8	9.6	8.3	6.2	4.5	3.6	2.8	5.1
Sandusky, Ohio	8.4	8.2	8.4	8.6	8.3	8.3	8.4	8.1	8.2	8.6	8.9	9.6	9.8	9.6	9.4	9.2	8.9	8.1	7.2	7.1	7.2	8.3	8.5	8.5	8.5
San Francisco, Cal.	10.5	9.5	9.5	8.5	8.4	7.7	7.3	7.1	6.9	6.8	6.8	7.1	8.6	9.4	11.4	14.0	16.4	18.3	19.1	19.9	19.0	17.7	14.6	11.7	11.5
San Luis Obispo, Cal.	2.7	3.0	3.0	2.6	2.9	3.1	2.7	3.1	3.1	3.2	3.5	3.8	4.3	5.2	6.2	7.4	8.2	8.9	8.1	7.5	6.3	5.4	4.2	3.6	4.7
Santa Fe, N. Mex.	6.5	6.3	4.4	4.2	4.3	3.9	3.8	3.9	4.0	3.6	4.7	6.0	6.8	7.4	8.3	9.6	9.9	9.0	8.6	8.0	5.6	7.1	7.9	7.7	6.3
Sault Ste Marie, Mich.	6.4	6.6	7.0	6.2	6.9	7.7	6.9	7.4	7.5	9.0	10.0	10.9	12.2	13.0	13.9	13.9	13.5	11.8	9.2	8.6	7.5	6.2	6.3	6.2	8.9
Savannah, Ga.	3.8	3.5	4.0	4.1	4.3	4.8	4.4	4.3	5.5	6.5	6.6	7.7	8.3	9.1	9.7	9.9	9.8	8.6	6.6	5.6	5.6	5.1	4.5	4.3	6.1
Seattle, Wash.	5.3	5.5	5.3	4.8	4.8	4.2	4.6	4.1	4.4	4.5	4.7	5.1	5.4	5.6	5.9	6.4	6.2	6.0	6.0	6.2	5.4	5.9	5.7	5.8	5.3
Shreveport, La.	5.1	5.2	4.6	4.2	3.8	3.5	4.0	4.2	5.1	6.1	6.6	6.7	7.2	7.6	7.7	7.9	8.2	8.4	6.9	5.5	5.6	5.7	5.6	5.7	5.9
Sioux City, Iowa	8.9	8.5	9.2	9.5	9.0	9.3	9.1	9.7	9.6	11.1	13.8	14.8	16.1	16.0	16.4	17.2	17.5	16.4	12.7	10.7	10.4	11.5	11.0	10.4	12.0
Spokane, Wash.	6.1	6.6	6.7	6.3	6.0	6.1	6.0	6.2	5.7	5.9	6.5	6.6	7.2	8.0	9.1	9.0	9.2	9.9	9.2	9.1	7.8	6.7	6.4	6.2	7.2
Springfield, Ill.	8.4	8.0	7.8	7.8	7.8	7.7	7.9	7.9	9.2	10.0	11.0	11.4	11.5	12.1	11.5	11.5	11.2	10.4	8.3	7.4	7.9	8.4	8.5	8.3	9.2
Springfield, Mo.	8.8	9.3	8.8	8.6	8.8	8.8	8.3	7.9	8.9	10.3	11.0	11.6	11.8	11.9	11.5	11.5	11.4	11.5	8.5	7.5	8.2	8.9	9.2	9.4	9.7
Tampa, Fla.	4.0	3.5	3.9	3.8	4.0	4.0	4.3	5.0	6.0	7.2	7.0	6.9	7.2	7.5	7.7	7.9	7.4	6.4	5.8	4.8	4.6	4.5	4.2	4.4	5.5
Tatoosh Island, Wash.	9.3	10.6	10.3	10.6	11.3	11.6	11.1	12.0	12.3	12.0	12.9	12.7	11.8	11.8	11.5	11.7	12.5	12.5	11.9	11.5	11.8	11.0	10.5	9.4	11.4
Titusville, Fla.	8.0	7.8	7.4	7.1	7.4	6.7	7.5	7.7	9.8	11.3	12.1	12.7	13.9	15.1	16.9	14.9	14.8	13.3	12.3	11.4	10.3	9.7	8.9	8.3	10.6
Toledo, Ohio	9.0	8.3	8.4	8.6	7.7	8.2	8.3	8.3	9.5	9.9	10.5	11.6	11.8	12.2	11.5	11.5	11.1	10.4	8.5	7.8	8.4	8.3	8.8	9.0	9.5
Vicksburg, Miss.	4.3	4.2	3.9	3.9	3.7	3.8	3.7	3.9	4.1	4.9	5.6	6.0	6.4	6.8	7.2	7.2	7.2	6.3	4.8	3.7	3.8	4.1	4.6	4.5	4.9
Vineyard Haven, Mass	6.2	6.1	6.1	6.2	6.3	7.0	7.0	7.9	7.8	8.7	9.4	9.6	9.8	9.8	9.5	9.2	8.9	7.9	7.2	7.6	7.3	7.0	6.9	6.8	7.8
Walla Walla, Wash.	5.6	5.1	5.1	5.1	5.6	5.2	4.7	5.0	5.1	5.5	5.4	6.0	7.0	7.0	6.9	7.1	6.9	6.5	6.1	5.7	5.4	5.5	5.8	5.8	5.8
Washington, D. C.	3.6	3.4	3.7	3.3	3.0	3.8	3.3	4.0	5.3	6.9	7.5	7.9	8.2	8.3	8.1	8.6	8.2	7.2	6.0	4.2	3.8	3.4	3.3	3.5	5.4
Wichita, Kans.	9.0	9.1	9.2	9.2	8.7	8.7	8.3	8.6	9.3	10.9	11.6	12.2	13.3	13.7	13.4	13.7	13.3	12.6	10.7	8.8	8.1	8.3	8.5	8.7	10.3
Williston, N. Dak.	6.7	7.0	7.4	8.3	7.6	7.2	7.2	8.4	8.8	9.9	11.6	13.7	15.4	17.1	19.5	20.5	20.2	19.2	16.6	14.1	10.5	10.0	8.0	7.1	11.8
Wilmington, N. C.	5.1	5.1	5.2	5.2	5.6	5.5	5.5	6.2	6.9	7.1	7.5	7.7	8.2	8.7	8.6	9.1	8.5	7.6	6.4	5.8	5.6	5.1	5.1	5.1	6.5
Winnemucca, Nev.	7.7	9.1	8.8	8.0	7.7	7.9	7.9	8.4	8.6	8.6	9.7	10.8	11.2	12.1	12.5	13.7	14.0	14.1	13.1	12.6	9.8	7.2	7.9	7.6	10.0
Woods Hole, Mass.	11.8	11.6	11.1	11.1	12.3	12.7	12.6	12.8	12.0	13.2	13.4	13.5	13.6	13.6	13.6	14.8	14.7	13.6	13.3	13.3	13.5	13.5	12.9	12.5	13.0
Yuma, Ariz.	5.1	5.0	4.9	4.3	3.8	3.9	3.8	4.0	3.8	4.2	5.8	7.8	7.7	7.9	8.1	8.2	8.2	8.0	7.9	8.4	7.3	6.8	6.7	5.3	6.1

TABLE VII.—*Heights of rivers above low-water mark, September*, 1895.

Stations.	Distance to mouth of river.	Danger-point on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Mississippi River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet*
St. Paul, Minn.	2,057	14.0	2.5	24	1.5	2, 16	2.0	1.0
La Crosse, Wis.	1,867	10.0	4.2	30	1.1	7	1.7	3.1
Dubuque, Iowa	1,759	15.0	1.9	30	0.3	11, 12	0.8	1.6
Davenport, Iowa	1,653	15.0	1.0	1, 30	0.1	14	0.5	0.9
Keokuk, Iowa	1,523	14.0	0.9	1	—0.5	17	0.1	1.4
Hannibal, Mo.	1,462	17.0	2.3	5	0.2	30	0.9	2.1
St. Louis, Mo.	1,321	30.0	10.9	8	3.5	30	7.2	7.4
Memphis, Tenn.	910	33.0	5.0	14	—0.4	30	2.8	5.4
Helena, Ark.	854	37.0	7.9	14	1.0	30	5.6	6.9
Arkansas City, Ark.	702	42.0	12.4	18	3.1	30	8.6	9.3
Greenville, Miss.	602	40.0	9.9	18, 19	2.3	30	7.1	7.1
Vicksburg, Miss.	541	41.0	9.3	30	1.9	30	5.8	7.4
New Orleans, La.	108	13.0	4.7	23	3.2	5,6	4.0	1.5
Illinois River.								
Beardstown, Ill.	76	12.0	7.8	7	6.2	23–27	6.8	1.6
Missouri River.								
Pierre, S. Dak.	1,132	13.0	2.4	1	1.5	27–30	1.9	0.9
Sioux City, Iowa	802	18.7	7.0	1	5.8	29, 30	6.4	1.2
Omaha, Nebr.	667	18.0	7.8	1	6.6	18–22, 30	7.0	1.2
Kansas City, Mo.	386	21.0	12.2	2	6.4	21, 22	8.1	5.8
Ohio River.								
Parkersburg, W. Va.	786	38.0	1.7	30	1.0	1–3	1.4	0.7
Catlettsburg, Ky.	652	50.0	4.5	4	2.3	21	3.3	2.2
Cincinnati, Ohio	500	45.0	6.4	1	3.8	29	4.9	2.6
Louisville, Ky.	368	24.0	4.2	2	3.0	26	3.5	1.2
Evansville, Ind.	184	30.0	3.7	1	1.1	30	2.3	2.6
Paducah, Ky.	47	40.0	3.5	13	0.8	30	2.5	2.7
Cairo, Ill.	1,140*	40.0	10.8	10	3.5	30	7.9	7.3
Monongahela River.								
Pittsburg, Pa.	966†	22.0	6.5	15	5.3	9, 10	5.8	1.2
Great Kanawha River.								
Charleston, W. Va.	61	30.0	5.3	1, 9	4.4	27	4.7	0.9

Stations.	Distance to mouth of river.	Danger-point on gauge.	Highest water.		Lowest water.		Mean stage.	Monthly range.
			Height.	Date.	Height.	Date.		
Miami River.	*Miles.*	*Feet.*	*Feet.*		*Feet.*		*Feet.*	*Feet*
Circleville, Ohio	65	13.0	1.4	1–21	1.0	28–30	1.3	0.4
Big Sandy River.								
Louisa, Ky.	.....	.....	5.9	3	2.1	29, 30	3.4	3.8
Wabash River.								
Mount Carmel, Ill.	50	15.0	3.5	9	0.0	2–4	1.0	3.5
Cumberland River.								
Burnside, Ky.	404	50.0	4.0	14	1.0	8–28	2.4	3.0
Nashville, Tenn.	145	40.0	8.4	10	1.0	30	2.6	7.4
Tennessee River.								
Knoxville, Tenn.	640	29.0	.....	.....	.....	.....	.....	.....
Chattanooga, Tenn.	455	33.0	3.4	2	0.9	30	2.2	2.5
Johnsonville, Tenn.	94	21.0	3.5	1	0.8	30	2.3	2.7
Arkansas River.								
Fort Smith, Ark.	351	22.0	15.5	13	3.1	30	8.3	12.4
Little Rock, Ark.	176	23.0	15.6	15	4.6	30	9.6	11.0
Red River.								
Shreveport, La.	449	29.2	5.4	1	—2.3	29, 30	1.0	7.7
James River.								
Lynchburg, Va.	251	18.0	0.1	1–4	—0.3	12–15	—0.1	0.4
Congaree River.								
Columbia, S. C.	.....	.....	15.0	1.5	12	0.1	24, 25, 29	0.6	1.4
Savannah River.								
Augusta, Ga.	140	32.6	9.8	3	4.9	30	6.5	4.9
Alabama River.								
Montgomery, Ala.	215	48.0	4.1	6,7	0.5	28, 30	2.1	3.6
Willamette River.								
Portland, Oreg.	.....	.....	15.0	3.6	19	0.8	27–29	2.6	2.8
Sacramento River.								
Red Bluff, Cal.	.....	.....	20.0	3.4	13	0.6	3–9	1.0	2.8
Sacramento, Cal.	.....	.....	28.0	13.0	15	8.8	7–11	9.9	4.2

*To mouth of Mississippi River.

†To mouth of Ohio River.

TABLE VIII.—*Temperature of the wet-bulb thermometer, September, 1895.*

Stations.	Local time faster or slower than 75th meridian time.	8 A. M.			8 P. M.		
		Max.	Min.	Mean.	Max.	Min.	Mean.
New England.	h. m.	°	°	°	°	°	°
Eastport, Me	32 F.	60	40	51	62	43	52
Portland, Me	19 F.	68	42	55	72	44	57
Northfield, Vt	9 F.	60	33	51	67	38	53
Boston, Mass	16 F.	70	48	57	74	43	60
Nantucket, Mass	20 F.	70	48	61	68	46	60
Woods [illegible] Mass	17 F.	.....	.....	.....	69	44	60
Block [illegible] I	14 F.	70	46	61	70	47	62
New H[illegible] onn	8 F.	71	43	59	72	41	61
New Lo[illegible] Conn	12 F.	70	46	61	72	44	62
Middle Atlantic States.							
Albany, N. Y	5 F.	69	42	57	73	41	59
New York, N. Y	4 F.	73	44	61	79	44	63
Harrisburg, Pa	7 S.	71	45	60	78	42	64
Philadelphia, Pa	0	75	43	62	76	43	63
Baltimore, Md	6 S.	72	43	63	76	42	65
Washington, D. C	8 S.	74	43	63	78	41	65
Lynchburg, Va	16 S.	72	42	62	74	42	66
Norfolk, Va	5 S.	76	48	68	77	48	68
South Atlantic States.							
Charlotte, N. C	23 S.	71	42	65	72	42	66
Hatteras, N. C	2 S.	77	58	71	79	52	71
Kittyhawk, N. C	3 S.	76	56	71	78	52	71
Raleigh, N. C	14 S.	72	42	66	73	43	67
Wilmington, N. C	12 S.	74	49	69	75	49	70
Charleston, S. C	30 S.	76	52	71	77	56	72
Augusta, Ga	27 S.	74	47	68	77	47	70
Savannah, Ga	34 S.	75	53	71	76	53	72
Jacksonville, Fla	26 S.	77	56	73	78	64	73
Florida Peninsula.							
Jupiter, Fla	20 S.	78	66	75	77	68	74
Key West, Fla	37 S.	77	72	76	78	74	76
Tampa, Fla	30 S.	77	66	74	77	67	74
Titusville, Fla	23 S.	79	67	75	78	69	75
Eastern Gulf States.							
Atlanta, Ga	37 S.	73	42	67	76	44	68
Pensacola, Fla	49 S.	79	48	73	79	52	74
Mobile, Ala	52 S.	78	47	72	78	51	74
Montgomery, Ala	45 S.	73	45	69	75	49	70
Meridian, Miss	55 S.	74	43	68	76	47	71
Vicksburg, Miss	1 03 S.	74	43	70	80	49	72
New Orleans, La	1 00 S.	77	47	73	77	52	74
Western Gulf States.							
Shreveport, La	1 14 S.	74	43	69	82	49	72
Fort Smith, Ark	1 17 S.	74	39	67	80	49	71
Little Rock, Ark	1 08 S.	75	41	67	78	47	70
Corpus Christi, Tex	1 30 S.	79	53	75	80	57	76
Galveston, Tex	1 19 S.	78	50	74	79	54	74
Palestine, Tex	1 22 S.	74	43	69	75	50	72
San Antonio, Tex	1 34 S.	74	47	70	74	49	71
Ohio Valley and Tenn.							
Chattanooga, Tenn	41 S.	71	41	66	75	44	70
Knoxville, Tenn	36 S.	70	42	65	75	44	68
Memphis, Tenn	1 00 S.	75	42	67	76	46	70
Nashville, Tenn	47 S.	72	41	65	76	43	68
Lexington, Ky	38 S.	72	38	61	73	39	63
Louisville, Ky	43 S.	72	39	61	76	43	66
Indianapolis, Ind	44 S.	74	35	60	76	41	64
Cincinnati, Ohio	38 S.	72	38	60	74	41	63
Columbus, Ohio	32 S.	72	37	59	71	39	61
Pittsburg, Pa	20 S.	72	40	60	74	38	63
Parkersburg, W. Va	26 S.	75	39	61	74	40	64
Lower Lake Region.							
Buffalo, N. Y	15 S.	70	38	58	70	39	58
Oswego, N. Y	6 S.	68	42	56	70	41	57
Rochester, N. Y	11 S.	68	38	56	70	39	58
Erie, Pa	20 S.	70	41	59	72	40	60
Cleveland, Ohio	27 S.	72	39	59	74	42	62
Sandusky, Ohio	30 S.	72	39	58	72	41	61
Toledo, Ohio	34 S.	73	37	58	73	38	61
Detroit, Mich	32 S.	71	38	58	72	38	59
Upper Lake Region.							
Alpena, Mich	34 S.	72	34	54	70	36	56
Grand Haven, Mich	45 S.	70	38	57	70	38	59
Marquette, Mich	49 S.	69	38	52	71	38	55
Port Huron, Mich	30 S.	69	35	56	71	40	58
Sault Ste. Marie, Mich	37 S.	66	32	50	68	36	53
Chicago, Ill	50 S.	71	34	58	76	42	62

Stations.	Local time faster or slower than 75th meridian time.	8 A. M.			8 P. M.		
		Max.	Min.	Mean.	Max.	Min.	Mean.
Up. Lake Region—Con.	h. m.	°	°	°	°	°	°
Milwaukee, Wis	51 S.	71	34	57	75	39	60
Green Bay, Wis	52 S.	70	32	55	73	37	58
Duluth, Minn	1 08 S.	66	37	51	70	40	58
North Dakota.							
Moorhead, Minn	1 27 S.	66	24	46	70	36	53
St. Vincent, Minn	1 29 S.	60	24	42	64	39	50
Bismarck, N. Dak	1 42 S.	61	24	42	68	37	51
Williston, N. Dak	1 54 S.	56	17	39	64	35	47
Upper Mississippi Valley.							
St. Paul, Minn	1 12 S.	70	33	54	75	41	58
La Crosse, Wis	1 05 S.	70	36	56	75	43	61
Davenport, Iowa	1 02 S.	72	35	59	76	42	63
Des Moines, Iowa	1 14 S.	70	32	58	75	39	62
Keokuk, Iowa	1 06 S.	71	36	60	74	43	63
Cairo, Ill	56 S.	73	42	64	78	47	69
Springfield, Ill	58 S.	72	35	59	76	43	64
Hannibal, Mo	1 05 S.	72	36	61	76	42	65
St. Louis, Mo	1 01 S.	72	41	64	78	46	68
Missouri Valley.							
Columbia, Mo	1 09 S.	.....	.....	.....	78	40	65
Kansas City, Mo	1 18 S.	73	35	62	77	42	65
Springfield, Mo	1 13 S.	72	35	62	75	41	66
Omaha, Nebr	1 24 S.	72	34	58	75	39	62
Sioux City, Iowa	1 26 S.	70	28	55	72	38	60
Pierre, S. Dak	1 41 S.	66	29	50	72	42	59
Huron, S. Dak	1 32 S.	67	24	48	72	40	56
Northern Slope.							
Havre, Mont	2 19 S.	50	20	38	62	34	48
Miles City, Mont	2 03 S.	55	23	42	78	38	55
Helena, Mont	2 28 S.	52	24	39	57	31	46
Rapid City, S. Dak	1 53 S.	60	28	44	66	34	52
Cheyenne, Wyo	1 59 S.	51	19	39	63	30	50
Lander, Wyo	2 15 S.	51	8	37	55	27	47
North Platte, Nebr	1 43 S.	64	24	49	71	39	58
Middle Slope.							
Denver, Colo	2 00 S.	52	28	43	60	36	53
Pueblo, Colo	1 58 S.	57	27	44	62	41	54
Concordia, Kans	1 31 S.	70	31	58	75	44	62
Dodge City, Kans	1 40 S.	65	28	55	70	41	61
Wichita, Kans	1 29 S.	71	34	61	79	42	65
Oklahoma, Okla	1 30 S.	71	36	63	77	44	67
Southern Slope.							
Abilene, Tex	1 39 S.	71	45	64	75	45	66
Amarillo, Tex	1 47 S.	65	33	55	67	40	59
Southern Plateau.							
El Paso, Tex	2 06 S.	64	42	58	68	43	62
Santa Fe, N. Mex	2 04 S.	53	36	45	58	36	51
Phœnix, Ariz	2 28 S.	71	38	60	78	54	69
Yuma, Ariz	2 38 S.	74	45	60	79	53	68
Independence, Cal	2 53 S.	58	28	42	59	38	53
Middle Plateau.							
Carson City, Nev	2 59 S.	50	20	38	55	33	48
Winnemucca, Nev	2 51 S.	53	15	36	54	32	49
Salt Lake City, Utah	2 27 S.	57	29	47	61	36	54
Northern Plateau.							
Baker City, Oreg	2 51 S.	52	29	39	58	33	49
Idaho Falls, Idaho	2 28 S.	52	18	38	60	34	51
Spokane, Wash	2 49 S.	53	29	42	59	39	49
Walla Walla, Wash	2 53 S.	56	35	47	64	43	55
N. Pac. Coast Region.							
Fort Canby, Wash	3 16 S.	56	45	52	62	49	54
Port Angeles, Wash	3 14 S.	52	32	44	54	44	50
Seattle, Wash	3 09 S.	57	37	48	62	45	53
Tatoosh Island, Wash	3 19 S.	54	43	49	56	46	51
Portland, Oreg	3 11 S.	61	39	49	63	44	53
Roseburg, Oreg	3 13 S.	54	36	47	70	45	55
Mid. Pac. Coast Region.							
Eureka, Cal	3 17 S.	54	43	49	59	50	54
Red Bluff, Cal	3 09 S.	60	41	52	68	46	60
Sacramento, Cal	3 06 S.	60	42	52	68	49	60
San Francisco, Cal	3 10 S.	59	47	53	62	51	55
S. Pac. Coast Region.							
Fresno, Cal	2 59 S.	60	38	50	67	48	59
Los Angeles, Cal	2 53 S.	60	45	53	65	56	61
San Diego, Cal	2 49 S.	63	46	58	66	58	62
San Luis Obispo, Cal	3 03 S.	58	40	49	61	50	57

TABLE IX.—*Resultant winds from observations at 8 a. m. and 8 p. m., daily, during September, 1895.*

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
New England.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Eastport, Me	14	19	12	26	s. 70 w.	15
Portland, Me	14	22	7	33	s. 73 w.	27
Northfield, Vt	18	35	2	12	s. 30 w.	20
Boston, Mass	19	19	6	31	n. 74 w.	26
Nantucket, Mass	18	12	18	27	n. 56 w.	11
Woods Hole, Mass.*	4	17	9	6	s. 18 e.	13
Block Island, R. I	15	20	16	26	s. 63 w.	11
New Haven, Conn	23	20	10	19	n. 72 w.	10
New London, Conn	24	17	12	18	n. 41 w.	9
Middle Atlantic States.						
Albany, N. Y	16	26	8	21	s. 82 w.	16
New York, N. Y	13	24	7	26	s. 60 w.	22
Harrisburg, Pa	19	14	15	20	n. 45 w.	7
Philadelphia, Pa	24	17	11	20	n. 52 w.	11
Baltimore, Md	20	21	8	18	s. 84 w.	10
Washington, D. C	21	21	15	13	e.	2
Lynchburg, Va	16	19	26	18	s. 69 e.	8
Norfolk, Va	15	19	26	14	s. 72 e.	13
South Atlantic States.						
Charlotte, N. C	10	30	22	10	s. 31 e.	23
Hatteras, N. C	19	17	20	17	n. 56 e.	4
Kittyhawk, N. C	15	23	25	17	s. 45 e.	11
Raleigh, N. C	18	23	15	17	s. 22 w.	5
Wilmington, N. C	24	16	22	14	n. 45 e.	11
Charleston, S. C	17	19	29	9	s. 84 e.	20
Augusta, Ga	18	22	28	6	s. 80 e.	22
Savannah, Ga	25	19	22	9	n. 65 e.	14
Jacksonville, Fla	24	9	34	7	n. 61 e.	31
Florida Peninsula.						
Jupiter, Fla	18	18	26	11	e.	15
Key West, Fla	9	17	43	3	s. 79 e.	41
Tampa, Fla	29	8	32	8	n. 49 e.	32
Titusville, Fla	19	11	38	14	n. 60 e.	16
Eastern Gulf States.						
Atlanta, Ga	20	14	25	14	n. 61 e.	12
Pensacola, Fla	28	17	21	10	n. 45 e.	16
Mobile, Ala	34	9	12	17	n. 11 w.	36
Montgomery, Ala	27	16	30	8	n. 52 e.	28
Meridian, Miss	34	16	26	5	n. 69 e.	22
Vicksburg, Miss	30	20	21	11	e.	10
New Orleans, La	16	26	26	10	s. 58 e.	19
Western Gulf States.						
Shreveport, La	17	27	25	4	s. 65 e.	23
Fort Smith, Ark	10	18	35	2	s. 76 e.	34
Little Rock, Ark	16	30	17	11	s. 23 e.	15
Corpus Christi, Tex	19	26	29	4	s. 74 e.	26
Galveston, Tex	9	32	29	7	s. 44 e.	32
Palestine, Tex	13	34	25	3	s. 46 e.	30
San Antonio, Tex	16	23	27	2	s. 74 e.	26
Ohio Valley and Tennessee.						
Chattanooga, Tenn	18	14	15	22	n. 60 w.	8
Knoxville, Tenn	30	12	16	14	n. 6 e.	18
Memphis, Tenn	21	21	21	6	e.	15
Nashville, Tenn	20	20	12	20	w... ..	8
Lexington, Ky	12	25	13	22	s. 35 w.	16
Louisville, Ky	19	29	8	12	s. 22 w.	11
Indianapolis, Ind	18	26	13	21	s. 45 w.	11
Cincinnati, Ohio	15	20	19	22	s. 31 w.	6
Columbus, Ohio	9	23	18	18	s.	14
Pittsburg, Pa	18	17	13	24	n. 85 w.	11
Parkersburg, W. Va	16	25	16	15	s. 6 e.	9
Lower Lake Region.						
Buffalo, N. Y	17	19	15	34	s. 77 w.	9
Oswego, N. Y	16	29	15	15	s.	13
Rochester, N. Y	11	28	13	30	s. 47 w.	25
Erie, Pa	14	29	9	20	s. 36 w.	19
Cleveland, Ohio	13	26	27	11	s. 49 e.	21
Sandusky, Ohio	9	25	14	23	s. 29 w.	18
Toledo, Ohio	11	21	10	28	s. 61 w.	21
Detroit, Mich	13	25	14	26	s. 45 w.	17
Upper Lake Region.						
Alpena, Mich	14	28	9	24	s. 47 w.	20
Grand Haven, Mich	14	26	13	24	s. 43 w.	16
Marquette, Mich	20	33	9	27	s. 81 w.	18
Port Huron, Mich	11	32	14	15	s. 3 w.	21
Sault Ste. Marie, Mich	11	27	25	17	s. 27 e.	18
Chicago, Ill	9	31	6	22	s. 36 w.	27

Stations.	Component direction from—				Resultant.	
	N.	S.	E.	W.	Direction from—	Duration.
Upper Lake Region—Cont'd.	*Hours.*	*Hours.*	*Hours.*	*Hours.*	°	*Hours.*
Milwaukee, Wis	9	31	14	19	s. 13 w.	23
Green Bay, Wis	9	34	12	16	s. 9 w.	25
Duluth, Minn	26	11	17	27	n. 34 w.	18
North Dakota.						
Moorhead, Minn	20	21	11	17	s. 80 w.	6
St. Vincent, Minn	19	15	15	25	n. 68 w.	11
Bismarck, N. Dak	24	11	16	25	n. 35 w.	16
Williston, N. Dak	25	12	9	27	n. 54 w.	22
Upper Mississippi Valley.						
St. Paul, Minn	8	30	20	20	s.	22
La Crosse, Wis	11	36	7	13	s. 13 w.	26
Davenport, Iowa	8	36	14	19	s. 10 w.	28
Des Moines, Iowa	11	32	10	18	s. 21 w.	22
Keokuk, Iowa	10	33	10	21	s. 26 w.	26
Cairo, Ill	22	29	10	11	s. 8 w.	7
Springfield, Ill	10	34	9	19	s. 23 w.	26
Hannibal, Mo	8	39	11	12	s. 2 w.	31
St. Louis, Mo	15	30	13	13	s.	15
Missouri Valley.						
Columbia, Mo.*	4	15	10	3	s. 32 e.	13
Kansas City, Mo	10	41	15	7	s. 14 e.	32
Springfield, Mo	8	36	21	8	s. 25 e.	31
Omaha, Nebr	13	28	25	9	s. 47 e.	22
Sioux City, Iowa	18	30	16	10	s. 27 e.	13
Pierre, S. Dak	25	12	17	17	n.	13
Huron, S. Dak	20	22	20	11	s. 77 e.	9
Northern Slope.						
Havre, Mont	19	10	11	33	n. 68 w.	24
Miles City, Mont	15	23	13	28	s. 51 w.	13
Helena, Mont	10	13	8	40	s. 85 w.	32
Rapid City, S. Dak	18	16	8	29	n. 85 w.	21
Cheyenne, Wyo	19	15	5	35	n. 82 w.	30
Lander, Wyo	10	25	5	30	s. 59 w.	29
North Platte, Nebr	13	26	14	20	s. 25 w.	14
Middle Slope.						
Denver, Colo	16	24	19	15	s. 27 e.	9
Pueblo, Colo	21	14	16	25	n. 52 w.	11
Concordia, Kans	12	37	7	9	s. 5 w.	25
Dodge City, Kans	12	37	21	1	s. 39 e.	32
Wichita, Kans	9	41	17	1	s. 27 e.	36
Oklahoma, Okla	12	39	14	6	s. 17 e.	28
Southern Slope.						
Abilene, Tex	10	39	16	9	s. 14 e.	30
Amarillo, Tex	5	46	4	12	s. 11 w.	42
Southern Plateau.						
El Paso, Tex	20	7	34	13	n. 59 e.	25
Santa Fe, N. Mex	9	29	19	24	s. 14 w.	21
Phœnix, Ariz	13	15	22	21	s. 27 e.	2
Yuma, Ariz	18	15	17	25	n. 69 w.	8
Independence, Cal	19	19	14	28	w... ..	14
Middle Plateau.						
Carson City, Nev	13	22	8	34	s. 71 w.	28
Winnemucca, Nev	19	13	11	29	n. 69 w.	19
Salt Lake City, Utah	21	16	21	18	n. 31 e.	6
Northern Plateau.						
Baker City, Oreg	20	25	11	16	s. 45 w.	7
Idaho Falls, Idaho	13	39	2	13	s. 23 w.	28
Spokane, Wash	13	27	13	19	s. 20 w.	15
Walla Walla, Wash	5	38	9	20	s. 18 w.	35
North Pacific Coast Region.						
Fort Canby, Wash	17	21	14	16	s. 27 w.	4
Port Angeles, Wash	6	25	15	23	s. 23 w.	21
Seattle, Wash	15	29	17	11	s. 23 e.	15
Tatoosh Island, Wash	3	26	21	20	s. 2 e.	23
Portland, Oreg	21	17	11	27	n. 76 w.	16
Roseburg, Oreg	33	10	10	20	n. 23 w.	25
Middle Pacific Coast Region.						
Eureka, Cal	14	19	9	30	s. 77 w.	22
Red Bluff, Cal	25	23	19	10	n. 77 e.	9
Sacramento, Cal	16	33	11	24	s. 38 w.	22
San Francisco, Cal	8	8	3	44	w... ..	41
South Pacific Coast Region.						
Fresno, Cal	22	3	11	36	n. 53 w.	31
Los Angeles, Cal	19	7	18	25	n. 30 w.	14
San Diego, Cal	28	6	10	33	n. 46 w.	32
San Luis Obispo, Cal	28	10	5	30	n. 54 w.	31

* From observations at 8 p. m. only.

TABLE X.—*Thunderstorms and auroras, September, 1895.*

States.	No. of stations.		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total. No.	Total. Days.	
Alabama	56	T.	3	4	3	2	....	5	4	....	1	1	....	..	1	....	2	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	28	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Arizona	45	T.	....	....	....	1	....	....	....	....	2	....	....	1	....	....	....	1	3	2	....	1	1	....	....	1	....	....	....	2	4	2	....	21	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Arkansas	51	T.	1	2	....	2	3	4	2	....	....	....	....	....	1	2	....	2	....	....	....	....	....	1	1	....	....	5	....	....	....	....	....	26	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
California	208	T.	....	....	....	....	....	....	1	1	....	1	....	....	....	....	1	....	5	3	....	....	....	....	....	....	....	....	....	1	....	1	....	14	8	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Colorado	88	T.	2	6	....	....	....	....	....	....	1	2	....	2	4	9	9	....	1	1	3	....	....	....	1	....	....	....	....	....	1	1	....	43	14	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	A.
Connecticut	22	T.	....	....	....	....	....	....	....	....	7	3	1	3	....	....	....	....	....	2	....	....	....	....	....	....	....	11	2	....	1	2	....	32	9	T.
		A.	..	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	2	A.
Delaware	7	T.	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	2	2	....	....	....	....	....	1	1	....	....	1	....	....	9	6	T.
		A.	....	....	....	....	....	....	....	....	....	....	1	....	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	A.
Dist. of Columbia	4	T.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	....	....	....	....	....	....	....	3	3	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Florida	38	T.	12	9	13	8	11	6	9	6	5	8	8	7	6	16	8	2	....	....	3	3	2	....	....	2	3	4	....	2	2	1	....	156	25	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Georgia	58	T.	1	....	....	....	....	1	1	1	....	2	....	....	1	1	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	9	8	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Idaho	35	T.	3	1	....	....	....	....	1	1	2	1	1	2	....	....	....	....	....	3	3	....	....	....	....	....	....	....	....	....	....	....	....	18	10	T.
		A.	....	....	....	....	....	....	1	....	....	....	....	....	....	....	1	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	4	4	A.
Illinois	86	T.	....	1	22	37	2	14	4	1	7	....	....	....	1	7	16	10	1	....	....	....	1	4	4	1	12	7	....	1	....	....	....	143	20	T.
		A.	....	....	1	....	....	....	....	....	....	....	....	....	....	2	....	1	....	6	....	....	....	....	....	....	....	....	....	....	....	....	....	11	5	A.
Indiana	42	T.	....	....	10	8	....	2	....	....	1	1	....	4	....	..	3	8	5	....	....	....	....	....	....	....	3	5	....	....	....	1	....	51	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Indian Territory	7	T.	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	2	2	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Iowa	95	T.	....	....	5	2	3	18	....	....	....	1	....	....	10	5	24	4	....	....	....	8	4	8	1	....	3	....	....	3	....	....	....	99	15	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	....	6	....	....	....	....	....	....	....	....	....	....	2	....	....	12	3	A.
Kansas	83	T.	....	1	2	2	....	7	....	7	2	....	....	....	....	....	....	....	....	....	....	1	1	1	....	....	1	....	....	1	....	....	....	26	11	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	1	1	A.
Kentucky	42	T.	....	....	....	2	..	....	3	....	....	1	....	....	....	....	....	4	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	4	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Louisiana	56	T.	12	7	....	....	1	....	2	4	1	....	10	2	3	1	4	4	2	2	....	7	7	10	3	1	1	3	1	....	....	....	88	22	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Maine	18	T.	....	....	....	....	....	....	....	....	....	1	4	....	....	....	....	....	....	....	....	....	1	....	....	....	1	9	....	....	....	....	....	16	5	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	1	5	4	1	....	1	1	....	....	....	....	....	....	....	....	....	....	....	....	13	6	A.
Maryland	40	T.	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	2	1	11	11	....	....	....	....	....	4	5	....	....	....	....	....	35	7	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Massachusetts	79	T.	2	....	....	1	....	....	....	....	26	10	39	21	1	....	....	....	....	....	....	....	....	....	....	....	....	21	5	....	....	....	....	126	9	T.
		A.	....	1	1	1	....	....	....	....	....	....	....	....	1	3	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	10	6	A.
Michigan	76	T.	....	1	4	1	2	5	1	....	8	3	6	4	....	3	9	3	9	8	7	2	1	....	1	....	14	5	....	1	....	....	98	22	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	4	2	A.
Minnesota	69	T.	5	2	3	2	16	8	1	5	6	7	6	1	5	5	9	....	7	1	2	17	17	10	....	1	....	....	....	....	....	....	....	136	22	T.
		A.	....	1	....	1	....	....	....	....	1	3	....	....	1	8	13	4	2	2	1	1	....	....	....	....	....	....	1	....	8	5	....	50	14	A.
Mississippi	52	T.	4	2	3	3	6	2	2	2	....	1	4	....	....	2	4	3	1	1	....	2	5	1	....	....	....	1	....	....	....	....	....	49	19	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Missouri	100	T.	1	2	6	14	7	16	1	6	4	....	....	....	....	2	4	17	2	....	....	....	....	6	....	....	11	3	....	3	....	....	....	105	17	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	1	1	A.
Montana	34	T.	....	2	....	....	1	....	....	....	....	3	....	....	1	....	....	....	....	1	3	....	....	....	....	....	....	....	....	....	....	....	....	11	6	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	2	3	3	3	3	1	....	....	....	....	....	....	....	....	2	1	....	....	18	8	A.
Nebraska	128	T.	....	....	....	....	4	2	....	1	....	....	....	3	2	4	7	....	....	....	....	7	10	4	....	....	....	....	....	1	1	....	....	46	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	....	....	....	....	....	....	....	....	....	....	....	....	....	7	1	A.
Nevada	49	T.	....	....	....	....	....	....	1	....	1	....	....	1	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	3	....	7	5	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
New Hampshire	26	T.	....	....	....	....	....	....	....	....	3	....	12	4	....	....	....	....	....	....	....	....	....	....	....	....	....	14	....	....	....	....	....	33	4	T.
		A.	1	....	....	....	....	....	1	1	....	....	....	....	....	1	2	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	6	A.
New Jersey	53	T.	....	....	....	....	....	1	1	....	1	7	....	8	2	....	....	1	....	12	....	....	....	....	....	....	....	12	....	....	1	....	....	46	10	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
New Mexico	32	T.	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	2	1	....	....	....	....	....	....	....	....	....	....	....	....	4	3	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
New York	82	T.	....	..	....	....	....	1	6	2	10	7	10	8	1	....	....	....	1	11	....	2	....	....	....	....	2	18	1	....	....	1	....	81	15	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	1	....	2	1	3	1	....	....	1	....	....	....	....	1	....	....	....	....	....	....	....	10	7	A.
North Carolina	56	T.	2	....	....	....	3	1	3	7	4	7	1	....	16	....	1	4	3	....	1	....	....	....	....	1	....	....	....	....	....	....	....	54	14	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
North Dakota	35	T.	....	4	1	1	1	....	....	....	1	1	....	....	....	1	....	....	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	12	9	T.
		A.	....	....	....	....	....	....	....	....	1	....	....	....	....	8	5	6	2	9	....	1	....	....	....	....	1	2	....	....	9	3	....	47	11	A.
Ohio	118	T.	....	....	1	22	5	7	8	....	16	10	....	48	3	....	3	11	15	13	2	....	....	....	1	....	1	7	....	....	....	....	....	173	17	T.
		A.	1	....	....	....	....	....	....	....	....	....	....	1	....	....	2	....	1	3	....	....	....	....	....	....	....	....	....	....	....	....	....	....	7	5	A.
Oklahoma	19	T.	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	2	2	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Oregon	63	T.	4	....	....	....	....	....	....	....	1	1	....	....	1	....	....	....	1	1	3	3	....	....	....	....	....	....	....	....	1	....	....	16	9	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	A.
Pennsylvania	95	T.	....	....	....	....	....	3	4	....	10	10	...	8	....	....	....	4	2	28	9	....	....	....	....	....	1	18	....	....	1	....	....	98	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Rhode Island	8	T.	1	....	....	....	....	....	....	....	2	1	....	3	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	....	....	....	....	10	6	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
South Carolina	42	T.	3	....	....	....	1	1	3	4	3	3	1	2	2	....	....	2	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	26	12	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
South Dakota	47	T.	....	....	1	....	1	....	....	4	1	1	....	....	1	1	....	....	....	3	....	3	2	....	....	....	....	....	....	....	....	....	....	18	10	T.
		A.	....	....	1	....	....	....	....	....	....	....	....	....	....	....	2	2	1	2	....	....	....	....	....	....	....	....	....	....	3	2	....	15	7	A.
Tennessee	40	T.	1	1	1	3	2	3	8	1	6	6	....	1	3	1	1	14	4	....	....	....	....	....	....	....	2	....	....	....	....	....	....	58	17	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Texas	86	T.	2	....	....	....	....	....	2	2	....	....	....	2	....	2	....	2	1	2	1	1	1	3	1	1	....	6	5	1	2	....	....	37	18	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Utah	36	T.	....	....	....	....	....	....	....	....	....	1	....	....	1	2	....	....	3	4	....	....	....	....	....	....	....	....	....	....	....	....	....	11	5	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Vermont	16	T.	....	....	....	....	....	....	....	....	1	1	12	5	....	....	....	....	....	1	1	....	....	....	....	....	1	9	....	....	....	....	....	31	8	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	2	1	A.
Virginia	29	T.	....	....	....	....	....	....	1	3	....	1	....	....	....	....	....	3	....	1	5	....	1	....	....	....	1	2	....	....	....	....	....	18	9	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Washington	48	T.	....	....	....	....	....	....	....	....	....	....	....	1	2	....	....	....	....	....	2	....	....	....	....	....	....	....	....	....	....	....	....	....	5	3	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	1	1	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	3	3	A.
West Virginia	38	T.	....	....	....	.	1	....	....	....	2	....	....	2	4	....	....	4	....	1	....	....	....	....	....	....	2	5	....	....	....	....	....	21	8	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	1	1	A.
Wisconsin	61	T.	1	....	1	2	1	2	....	4	3	5	....	1	1	6	22	....	10	....	2	12	4	19	1	....	6	....	....	....	....	....	....	108	19	T.
		A.	....	....	....	....	....	....	....	1	....	1	....	....	1	2	1	7	....	3	1	....	....	....	....	1	....	....	....	....	4	2	....	24	11	A.
Wyoming	11	T.	....	....	....	....	....	....	....	....	....	1	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1	1	T.
		A.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	0	0	A.
Sums	2,703	T.	60	45	76	103	71	113	68	62	138	110	116	143	75	70	127	107	79	115	65	66	60	69	15	8	68	177	18	17	12	12	....	2,268	....	T.
		A.	2	2	3	2	0	0	2	3	1	6	1	2	4	31	34	44	12	43	7	3	0	2	0	1	3	2	1	0	28	13	....	252	....	A.

TABLE XI.—*Hourly sunshine as deduced from sunshine recorders, September, 1895.*

Stations.	Instrument.	Percentages for each hour of local mean time ending with the respective hour.																		Monthly summary.			
		A. M.								P. M.										Instrumental record.			Personal estimate.
		5	6	7	8	9	10	11	Noon.	1	2	3	4	5	6	7	8	Actual.	Possible.	Per cent of possible.	
																		Hours.	Hours.		
Atlanta, Ga	T.	.....	58	60	68	76	74	79	83	81	84	83	69	60	56	32	.....	266.0	371.7	72	74
Baltimore, Md	T.	.....	53	53	55	72	77	90	91	88	90	85	83	76	77	68	.....	290.2	373.6	78	73
Bismarck, N. Dak	P.	.....	35	49	65	67	71	73	64	63	67	69	67	62	49	50	.....	236.8	377.1	63	58
Boston, Mass	T.	.....	47	48	62	69	72	82	83	83	81	76	68	56	47	45	.....	254.8	374.6	68	57
Buffalo, N. Y	T.	.....	18	22	44	57	59	70	73	78	77	79	70	60	39	27	.....	221.0	374.3	59	46
Chicago, Ill	T.	.....	63	65	76	87	94	95	98	89	90	91	91	88	77	79	.....	321.1	374.1	86	71
Cincinnati, Ohio	T.	.....	78	81	82	80	87	92	95	93	97	91	89	78	74	69	.....	321.6	373.4	86	67
Cleveland, Ohio	P.	.....	39	41	51	60	70	69	71	71	70	67	64	49	35	58	.....	222.4	374.2	59	50
Columbus, Ohio	T.	.....	31	30	40	67	71	75	75	76	74	74	64	58	37	33	.....	226.8	373.6	61	48
Denver, Colo	P.	.....	90	84	87	88	90	91	93	92	95	89	88	87	86	75	.....	333.3	373.7	89	74
Des Moines, Iowa	T.	.....	73	78	78	83	89	96	95	94	89	87	79	74	71	75	.....	314.4	374.1	84	67
Detroit, Mich	T.	.....	37	34	59	74	82	87	90	88	90	84	80	68	55	47	.....	273.2	374.8	73	61
Dodge City, Kans	P.	.....	76	78	80	86	88	88	86	83	91	89	85	86	78	69	.....	314.6	372.7	84	77
Eastport, Me	P.	.....	26	31	44	62	71	67	66	73	69	65	66	57	53	41	.....	221.6	376.0	59	40
Galveston, Tex	P.	.....	37	52	78	81	76	77	75	78	82	85	87	83	74	58	.....	282.7	370.3	76	67
Helena, Mont	P.	.....	49	48	51	59	61	63	58	57	61	57	60	59	59	59	.....	216.0	377.3	57	58
Kansas City, Mo	P.	.....	61	65	69	81	90	90	86	87	86	85	85	74	63	35	.....	263.0	373.5	78	73
Little Rock, Ark	T.	.....	58	67	68	76	78	86	88	87	92	84	78	78	80	83	.....	296.2	371.8	80	61
Louisville, Ky	T.	.....	69	71	67	77	79	82	83	82	83	85	80	69	71	72	.....	288.4	372.8	77	63
Marquette, Mich	T.	.....	11	25	46	58	62	76	80	82	80	70	62	59	41	7	.....	223.7	376.4	59	41
New Orleans, La	T.	.....	51	69	93	96	96	95	90	87	90	86	81	74	53	23	.....	307.5	371.0	83	83
New York, N. Y	T.	.....	25	32	49	73	83	87	93	90	89	80	83	71	45	36	.....	269.2	373.9	72	66
Philadelphia, Pa	T.	.....	47	59	64	69	87	93	94	95	95	91	89	77	68	72	.....	302.2	373.7	81	58
Phœnix, Ariz	P.	.....	93	83	67	92	91	91	91	95	94	93	93	93	89	100	.....	331.9	371.3	89	77
Portland, Me	T.	.....	8	35	64	68	77	87	89	89	86	83	72	68	38	17	.....	258.0	375.0	69	55
Portland, Oreg	T.	.....	14	23	20	31	45	55	64	65	58	60	45	35	40	22	.....	165.5	376.2	44	44
Do	P.	.....	14	37	21	36	51	59	63	65	61	65	54	54	44	22	.....	179.0	376.2	48	44
Rochester, N. Y	T.	.....	48	49	61	68	64	69	69	75	82	82	77	61	53	57	.....	250.9	374.5	67	58
St. Louis, Mo	T.	.....	52	57	61	73	84	93	95	90	92	93	93	84	81	69	.....	306.2	373.1	82	66
Salt Lake City, Utah	P.	.....	68	74	78	74	74	74	72	79	74	80	75	77	71	68	.....	270.9	374.6	73	57
San Diego, Cal	P.	.....	15	21	33	60	86	90	93	98	100	95	90	88	89	91	.....	286.9	371.5	77	72
San Francisco, Cal	T.	.....	7	15	42	55	67	72	78	85	87	86	71	65	52	38	.....	233.4	372.6	63	60
Santa Fe, N. Mex	P.	.....	81	82	87	89	84	89	91	90	89	88	87	86	75	82	.....	319.0	372.1	86	75
Savannah, Ga	P.	.....	60	67	82	81	76	79	73	80	78	77	75	76	63	42	.....	277.9	371.3	75	67
Vicksburg, Miss	T.	.....	81	83	87	96	97	97	99	96	97	96	87	79	68	58	.....	332.9	371.2	90	84
Washington, D. C	P.	.....	43	51	64	78	85	88	82	87	92	83	88	79	64	69	.....	288.2	373.3	77	72
Wilmington, N. C	T.	.....	31	46	72	80	86	86	89	90	91	80	76	62	38	26	.....	273.7	371.9	74	75

TABLE XII.—*Hourly precipitation, September, 1895.*

Stations.	1 a. m.	2 a. m.	3 a. m.	4 a. m.	5 a. m.	6 a. m.	7 a. m.	8 a. m.	9 a. m.	10 a. m.	11 a. m.	Noon.	1 p. m.	2 p. m.	3 p. m.	4 p. m.	5 p. m.	6 p. m.	7 p. m.	8 p. m.	9 p. m.	10 p. m.	11 p. m.	Midnight.	Total.
Atlanta, Ga	0.01	T.	T.	T.	T.	T.	0.01	0.04	T.	T.	0.01	0.00	T.	0.10	0.01	0.01	0.02	0.00	0.00	T.	T.	0.00	0.00	0.00	0.21
Baltimore, Md.*	0.00	0.00	0.20	0.40	0.12	0.10	0.10	0.10	0.11	0.16	0.16	0.06	0.40	0.50	0.30	1.21	0.92	0.95	0.10	0.00	T.	0.01	T.	0.00	6.01
Bismarck, N. Dak	T.	0.05	0.05	0.29	0.16	0.02	0.02	T.	0.01	T.	T.	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.65
Boston, Mass	0.08	0.24	0.01	0.14	0.07	0.05	T.	T.	T.	0.04	0.00	0.03	0.01	0.00	0.14	0.01	T.	0.00	T.	T.	0.04	0.09	0.17	0.08	1.20
Buffalo, N. Y	T.	T.	0.13	0.35	0.68	0.27	0.06	0.04	T.	0.02	0.00	T.	T.	T.	T.	0.15	0.06	0.10	0.35	0.22	0.02	0.02	0.02	T.	2.59
Chicago, Ill	0.02	0.02	0.03	0.15	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.01	0.01	0.01	T.	0.00	0.00	0.37	0.01	0.03	0.11	0.11	0.89
Cincinnati, Ohio	0.01	0.04	0.01	0.00	0.00	0.00	T.	0.32	0.09	0.01	0.03	0.00	0.00	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.52
Cleveland, Ohio	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.02	0.02	0.04	0.01	T.	T.	0.01	T.	0.60	0.07	0.05	0.41	0.06	0.09	0.10	0.02	0.07	1.64
Denver, Colo.*	0.09	0.09	0.09	0.09	0.08	0.08	0.08	0.08	T.	0.00	0.00	0.00	T.	0.00	0.00	0.00	0.01	T.	0.00	T.	0.01	0.09	0.09	0.10	0.98
Detroit, Mich	T.	T.	0.04	0.16	0.03	0.00	0.01	0.18	0.02	T.	0.03	0.04	0.28	0.28	0.01	0.04	0.01	0.00	T.	0.02	T.	T.	0.00	0.00	1.15
Dodge City, Kans	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.06	T.	T.	0.00	0.00	T.	0.00	0.00	T.	0.00	0.00	0.00	0.00	T.	T.	0.00	0.00	0.06
Duluth, Minn	0.41	0.30	0.76	0.29	0.27	0.11	0.17	0.19	0.18	0.94	0.33	0.11	0.06	0.18	0.17	0.08	0.10	0.06	0.04	0.06	0.19	0.25	0.25	0.22	5.72
Eastport, Me	0.01	0.00	0.00	0.00	0.03	0.14	0.01	0.10	0.12	0.18	0.01	0.01	T.	T.	0.01	T.	0.08	0.04	0.26	0.22	0.18	0.21	0.10	0.05	1.71
Galveston, Tex	0.01	0.01	0.01	0.00	0.01	0.06	0.05	0.08	0.14	0.06	0.08	0.11	0.12	0.49	0.50	0.03	T.	0.01	0.01	T.	0.00	0.00	T.	0.00	1.78
Indianapolis, Ind.*	0.00	0.15	1.27	1.10	1.24	1.10	1.18	1.15	0.14	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	T.	0.10	T.	0.00	7.46
Jacksonville, Fla	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	T.	T.	T.	0.30	0.18	0.05	0.50	0.88	1.84	0.24	0.07	0.03	0.15	0.17	0.14	0.01	4.66
Jupiter, Fla.*	0.02	0.43	0.02	0.38	0.06	0.36	0.04	0.88	0.21	0.01	0.01	0.04	0.46	0.71	2.45	0.57	0.32	0.76	0.40	0.61	0.09	0.04	0.04	0.01	8.94
Kansas City, Mo	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.09	0.36	0.15	0.01	0.01	T.	0.20	0.17	0.12	0.02	0.01	T.	0.00	0.00	0.23	0.00	0.00	1.37
Key West, Fla	0.31	0.12	0.12	0.05	0.08	0.02	0.11	0.20	0.38	0.46	0.11	0.15	T.	0.17	0.09	0.13	0.72	0.21	0.10	0.35	0.29	0.07	0.22	0.13	4.62
Little Rock, Ark	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	T.	T.	0.02	0.02	0.01	T.	0.19	0.10	0.02	0.01	T.	0.00	T.	0.02	0.42
Louisville, Ky	0.00	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.06	0.02	0.13	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50
Marquette, Mich	T.	T.	0.01	0.05	0.33	0.30	0.28	0.20	0.07	0.12	0.02	0.01	0.02	0.03	0.02	0.04	0.14	0.24	0.11	0.36	0.73	0.37	0.13	0.04	3.52
Memphis, Tenn	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.01	0.02	0.01	0.09	0.18	0.14	0.14	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.69
Milwaukee, Wis	0.07	0.00	0.06	0.11	0.00	0.00	0.00	0.00	T.	T.	0.03	0.16	T.	0.00	0.00	0.56	0.22	0.08	0.00	0.27	0.15	T.	T.	0.05	1.76
Nantucket, Mass	0.16	0.38	0.37	0.22	0.35	0.02	0.03	0.04	0.01	0.01	0.04	0.01	0.02	0.01	T.	0.00	0.05	0.00	0.00	0.01	T.	0.00	0.01	0.00	1.59
Nashville, Tenn.*	0.00	0.00	0.00	0.00	0.08	0.00	0.10	0.65	0.14	0.27	0.31	0.01	0.30	T.	0.00	0.05	0.33	T.	T.	0.00	0.00	0.03	0.43	1.25	6.76
New Orleans, La	0.00	0.00	0.00	0.06	T.	T.	0.00	T.	0.10	0.70	0.01	0.04	0.21	0.05	0.34	0.16	0.07	0.03	0.02	0.01	0.12	0.03	0.02	0.00	1.97
New York, N. Y	T.	0.00	0.00	0.00	0.02	T.	0.00	T.	0.04	0.05	0.00	0.00	0.00	T.	T.	0.04	T.	0.26	0.06	0.12	0.02	0.17	0.13	0.03	0.93
Norfolk, Va	0.00	0.06	T.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	0.11	0.02	0.00	0.00	T.	T.	T.	0.00	0.00	T.	T.	0.00	0.19
Omaha, Nebr	0.12	0.19	T.	0.01	0.01	0.01	0.01	0.06	0.10	0.10	0.08	0.16	0.01	T.	0.01	T.	T.	0.00	T.	T.	0.01	0.00	0.02	0.00	0.90
Philadelphia, Pa	T.	0.01	0.01	0.01	0.02	0.11	0.14	0.03	0.07	0.04	0.00	0.00	0.00	0.00	0.03	T.	0.01	0.03	0.02	0.03	T.	0.03	0.01	0.02	0.60
Pittsburg, Pa	0.05	0.00	0.00	0.00	0.00	0.05	T.	0.24	T.	0.00	0.01	T.	0.04	0.04	T.	0.00	0.00	0.75	0.42	0.03	T.	0.02	0.03	0.15	1.83
Portland, Me	0.10	0.12	T.	0.17	0.14	0.06	0.03	0.23	T.	T.	0.01	0.03	0.06	T.	0.01	T.	0.05	0.10	0.09	0.23	0.02	0.00	0.00	0.01	1.46
Portland, Oreg	0.02	T.	0.01	T.	T.	0.02	0.10	0.05	0.05	T.	0.02	0.01	0.04	0.03	0.05	0.09	0.11	0.10	0.19	0.05	0.05	0.04	0.10	0.03	1.16
Rochester, N. Y	0.03	0.04	0.09	0.17	0.31	0.99	0.21	0.06	0.02	0.02	0.14	0.02	0.01	T.	0.03	0.07	0.04	T.	0.02	0.04	0.02	0.01	0.03	0.03	2.40
St. Louis, Mo	0.00	0.00	0.03	0.00	0.20	0.23	0.35	0.14	0.04	0.02	0.15	0.29	0.16	0.10	0.01	T.	0.00	T.	0.00	0.00	T.	0.00	0.00	0.00	1.76
St. Paul, Minn	0.28	0.06	0.03	0.03	0.16	0.30	0.32	0.09	0.09	0.34	0.27	0.05	0.29	0.61	0.33	0.21	0.20	0.18	0.16	0.13	0.19	0.15	0.08	0.02	4.49
Salt Lake City, Utah*	0.03	0.03	0.02	0.02	0.02	0.03	0.02	0.04	0.01	T.	0.04	0.05	0.12	0.12	0.03	0.13	0.02	0.02	0.00	0.00	0.01	0.03	0.06	0.08	0.93
San Diego, Cal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
San Francisco, Cal	0.01	0.06	0.03	T.	0.01	0.01	0.01	0.02	0.07	0.18	0.07	0.01	0.05	0.01	T.	T.	0.01	0.01	0.06	0.02	0.08	0.02	0.03	T.	0.77
Savannah, Ga	0.06	0.02	0.02	0.22	0.34	0.31	0.21	0.16	0.02	0.11	0.05	0.11	0.16	0.09	0.16	0.01	0.18	0.09	0.06	0.01	0.01	0.04	0.05	0.18	2.64
Seattle, Wash	0.12	0.06	0.01	T.	T.	T.	0.01	0.01	0.02	0.06	0.04	0.05	0.02	0.02	T.	0.01	0.02	0.13	0.10	0.09	0.16	0.04	0.04	0.04	1.02
Vicksburg, Miss	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	T.	T.	0.00	0.00	0.00	T.	T.	T.	0.01	0.00	T.	0.00	0.00	0.00	0.02	0.14
Washington, D. C	T.	0.13	T.	0.06	0.05	0.01	0.19	0.08	0.01	0.15	0.24	0.04	T.	0.00	T.	0.00	0.00	T.	0.03	T.	0.02	0.09	0.04	0.02	1.07
Wilmington, N. C	0.00	T.	0.02	0.09	0.08	0.18	0.60	0.65	0.15	0.15	0.22	0.18	0.64	0.21	0.56	0.02	0.01	0.04	0.52	0.04	0.00	0.01	0.08	0.01	4.46

* Record incomplete.

TABLE XIII.—*Excessive precipitation, by stations, for September, 1895.*

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Alabama.	*Inches.*	*Inches.*		*Ins.*	*h. m.*	
Citronelle				1.01	1 00	5
Florence		2.70	16-17			
Madison Station				1.65	1 00	7
Newburg		2.57	16-17			
Scottsboro				1.40	1 00	16
Tuscaloosa				1.30	0 35	7
Arizona.						
Calabasas				1.10	1 00	13
Dudleyville				2.00	0 30	8
Farleys Camp				1.50	1 00	6
Mount Huachuca		3.58	23			
Tucson *c*				1.40	1 00	8
Arkansas.						
Camden *b*				1.32	0 55	26
Stuttgart				2.35	2 00	26
California.						
Bowmans Dam	10.12	6.07	11-13			
Edmanton		3.95	12			
Eureka		2.77	11-12			
Hydesville		2.74	11			
La Porte		3.16	12			
Quincy		3.04	12			
Shasta		2.53	12			
Trinidad (L. H.)		3.24	10-11			
Upper Mattole		7.41	11-12			
Delaware.						
Milford		2.80	5-6			
Florida.						
Green Cove Springs		2.85	2			
Jacksonville				1.08	1 00	13
Jupiter		3.37	3-4	2.10	1 00	3
Myers		3.30	11			
Titusville		2.74	10			
Georgia.						
Augusta				1.08	1 02	6
Illinois.						
Atlanta		3.35	4-5			
Decatur		3.33	3-4			
East Peoria		3.25	3-4			
Galva		2.86	3-4			
Knoxville		2.50	4	2.50	2 00	4
Peoria *a*		2.86	3-4			
Philo		2.62	3-4			
Rantoul		3.72	3-4	1.63	0 45	3
Tampico		3.28	3-4			
Tuscola		3.81	3-4			
Indiana.						
Franklin		2.50	3			
Indianapolis		6.80	3-4	1.25	1 00	4
Lyford		2.92	3-4			
Rockville		3.29	3-4			
Indian Territory.						
Kemp		2.84	26			
Iowa.						
Alta		5.40	20-21			
Atlantic				2.04	1 50	6
Chariton		2.75	14-15			
Emmetsburg		2.50	21			
Estherville		3.90	20-21			
Greenfield		3.97	15-16			
Maple Valley		3.00	20			
Osage		3.09	20			
Osceola				2.03	2 00	15
Winterset		2.67	15			
Kansas.						
Achilles		2.58	21-22			
Burlington		4.75	8-9			
Columbus	10.12	2.64	5			
Do		4.20	8-9			
Emporia		8.15	8-9			
Eureka		5.44	8-9			
Independence		4.73	8-9			
Lawrence		3.88	6			
Lebo		7.82	8-9			
Sedan				1.13	0 40	6
Wakefield				1.35	1 10	8
Yates Center		6.37	7-8			
Kentucky.						
Marrowbone				1.23	1 00	10
Louisiana.						
Alexandria				1.60	1 25	3
Emilie				2.15	0 15	2
Wallace				1.03	1 00	20
Maryland.						
Bachmans Valley		4.80	6			
Baltimore		4.76	6			
Easton				1.33	1 00	19
Ellicott City		3.12	6			
Fallston		3.15	6			
Frederick		4.26	6			
Westminster		4.48	6			
Woodstock		4.10	6			
Massachusetts.						
Amherst				1.25	1 00	11
Michigan.						
Arbela				1.60	1 10	12
Calumet	10.36	2.70	28			
Charlevoix		3.75	10			
Mayville				1.00	1 00	12

TABLE XIII.—*Excessive precipitation*—Continued.

Stations.	Monthly rainfall 10 inches, or more.	Rainfall 2.50 inches, or more, in 24 hours.		Rainfall of 1 inch, or more, in one hour.		
		Amt.	Day.	Amt.	Time.	Day.
Michigan—Cont'd.	*Inches.*	*Inches.*		*Ins.*	*h. m.*	
Olivet		3.55	17	3.55	2 00	17
Sault Ste Marie				1.02	0 45	11
Minnesota.						
Albert Lea				1.62	1 00	10
Bird Island		2.93	21-22			
Bonniwell		3.55	22			
Cambridge		3.54	21			
Clear Lake		3.02	22			
Collegeville		2.54	22			
Farmington		3.45	21			
Hutchinson		3.25	21			
Long Prairie				2.13	1 15	5
Maple Plain		4.15	21-22			
Minneapolis *a*		3.64	21-22			
Minneapolis (W. B.)		2.80	21-22			
New Ulm		4.92	21-22			
St. Cloud		3.00	21-22			
St. Paul		3.00	21-22			
St. Peter		6.22	21-22			
Winona		4.20	20-21			
Worthington		5.28	21-22			
Mississippi.						
Duck Hill				1.85	1 30	26
Logtown				1.05	1 00	8
Missouri.						
Bluffton		2.57	6			
Fulton		2.50	6	2.50	2 30	6
Houstonia (near)				1.23	1 15	16
Nevada				1.96	1 00	5
Oto		3.50	26			
Warrenton		2.88	4			
Willow Springs		3.50	26			
Nebraska.						
Ansley		2.78	21-22			
Arcadia		3.00	21			
David City		2.50	21-22			
Indianola		3.20	21			
McCook		3.22	21			
Mason City		3.00	21			
Oakdale		2.56	21-22			
Ord		3.06	22			
Schuyler		2.75	22			
Spencer				2.15	1 30	5
North Carolina.						
Hatteras		4.29	29			
Louisburg				1.16	0 45	9
Saxon				1.83	1 30	9
Wilmington				1.17	0 42	9
Ohio.						
Coalton				1.08	0 40	12
Milligan				1.52	1 00	12
Vickery				1.15	0 35	4
Wooster		3.28	12			
Oklahoma.						
Oklahoma		2.68	6	2.50	1 00	6
Oregon.						
Bandon	10.28	3.80	11			
Langlois		3.95	11			
Pennsylvania.						
Driftwood		2.55	9-10			
Farrandsville		4.91	8-9			
Johnstown				2.40	1 30	10
Lewisburg		3.20	9-10			
Mifflin				1.95	0 30	9
Pittsburg				1.11	0 26	10
Ridgway				1.19	0 45	10
York		3.17	6			
South Carolina.						
Charleston		2.91	8-9			
St. Matthews				1.08	1 00	10
South Dakota.						
Greenwood				1.59	1 30	5
Plankinton				1.22	1 00	5
Tennessee.						
Ashwood		2.55	10	2.55	2 30	10
Clarksville				1.02	1 00	9
Lynnville		3.53	10	3.53	3 00	10
Nashville		4.93	9-10	1.26	1 00	9
Rugby				1.00	1 00	16
Texas.						
Abilene		2.66	28			
Albany		2.54	1			
Brazoria				1.51	1 05	27
Camp Eagle Pass		3.05	27			
Dallas		2.62	7			
Fort Brown		3.37	23			
Fort Ringgold		2.75	17			
Fort Stockton		3.12	1			
Do		2.68	29			
Wisconsin.						
Antigo		2.57	15			
Apollonia		3.05	21			
Barron		3.04	21-22			
Butternut	10.21	3.85	15			
Do		3.50	22			
Hayward		3.50	22			
Osceola		3.47	22			
Whitehall		2.60	21			

TABLE XIV.—*Maximum rainfall in one hour or less, September*, 1895.

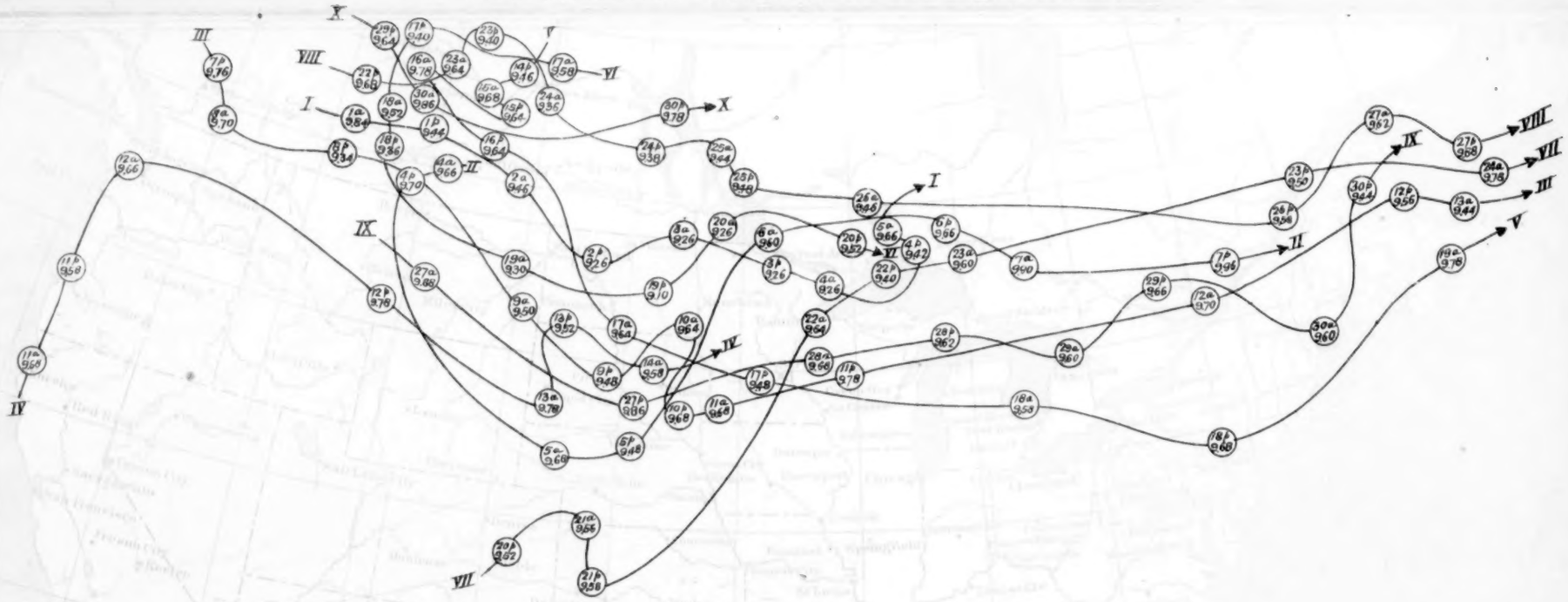
Stations.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Atlanta, Ga.	0.03	15	0.05	15	0.11	15
Baltimore, Md.*						
Bismarck, N. Dak.	0.04	21	0.08	21	0.29	21
Boston, Mass.	0.02	9	0.04	9	0.14	9
Buffalo, N. Y.	0.14	26	0.20	26	0.67	26
Chicago, Ill.	0.13	15	0.24	15	0.37	15
Cincinnati, Ohio	0.06	26	0.11	26	0.32	26
Cleveland, Ohio	0.30	12	0.39	4,12	0.60	4
Denver, Colo.*						
Detroit, Mich.	0.05	4	0.09	4	0.41	4
Dodge City, Kans.	0.01	22	0.02	22	0.06	22
Duluth, Minn.	0.30	11	0.37	11	0.80	11
Eastport, Me.	0.14	26	0.16	26	0.26	26
Galveston, Tex.	0.10	12	0.18	12	0.48	12
Indianapolis, Ind.*	0.94	4	0.35	4	1.25	4
Jacksonville, Fla.	0.94	13	0.39	13	1.08	13
Jupiter, Fla.*	0.33	4,6	0.63	6	2.10	6
Kansas City, Mo.	0.15	6	0.25	6	0.48	6
Key West, Fla.	0.27	23	0.47	23	0.67	23
Little Rock, Ark.	0.01	1	0.02	1	0.09	1
Louisville, Ky.	0.11	16	0.15	16	0.19	16
Marquette, Mich.	0.12	15	0.15	15	0.36	21
Memphis, Tenn.	0.11	26	0.16	26	0.32	26
Milwaukee, Wis.	0.42	15	0.55	15	0.68	15

TABLE XIV.—*Maximum rainfall*—Continued.

Stations.	Maximum rainfall in—					
	5 min.	Date.	10 min.	Date.	1 hour.	Date.
	Inch.		*Inch.*		*Inch.*	
Nantucket, Mass.	0.08	30	0.15	30	0.33	27
Nashville, Tenn.*	0.40	9	0.55	9	1.23	9
New Orleans, La.	0.30	16	0.57	16	0.71	16
New York, N. Y.	0.14	26	0.23	26	0.27	26
Norfolk, Va.	0.07	8	0.10	8	0.12	8
Omaha, Nebr.	0.07	6	0.12	6	0.25	6
Philadelphia, Pa.	0.02	7	0.04	7	0.17	7
Pittsburg, Pa.	0.43	10	0.70	10	1.11	10
Portland, Me.	0.07	26	0.10	26	0.23	26
Portland, Oreg.	0.02	11	0.04	11	0.10	12
Rochester, N. Y.	0.20	26	0.25	26	0.79	26
St. Louis, Mo.	0.17	16	0.18	16	0.25	6,16
St. Paul, Minn.	0.12	22	0.18	22	0.64	22
Salt Lake City, Utah*	0.02	18	0.05	18	0.13	18
San Diego, Cal.	0.01	28	0.01	28	0.01	28
San Francisco, Cal.	0.03	12	0.05	12	0.17	12
Savannah, Ga.	0.13	10	0.17	10	0.30	9,10
Seattle, Wash.	0.03	19	0.05	19	0.10	30
Vicksburg, Miss.	0.01	2	0.03	2	0.11	2
Washington, D. C.	0.08	6	0.13	6	0.26	18
Wilmington, N. C.	0.30	8,9	0.55	9	1.17	9

* Record incomplete.

Chart I. Tracks of Centers of Low Areas. September, 1895.



NOTES.

The roman letters show number and order of centers of low areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations.

The queries (?) on the tracks show that the centers could not be satisfactorily located.

Within each circle is given the lowest barometric reading reported near the center. A blank indicates that no reports were available.

A wavy line indicates the axis of a trough or long oval area of low pressure.

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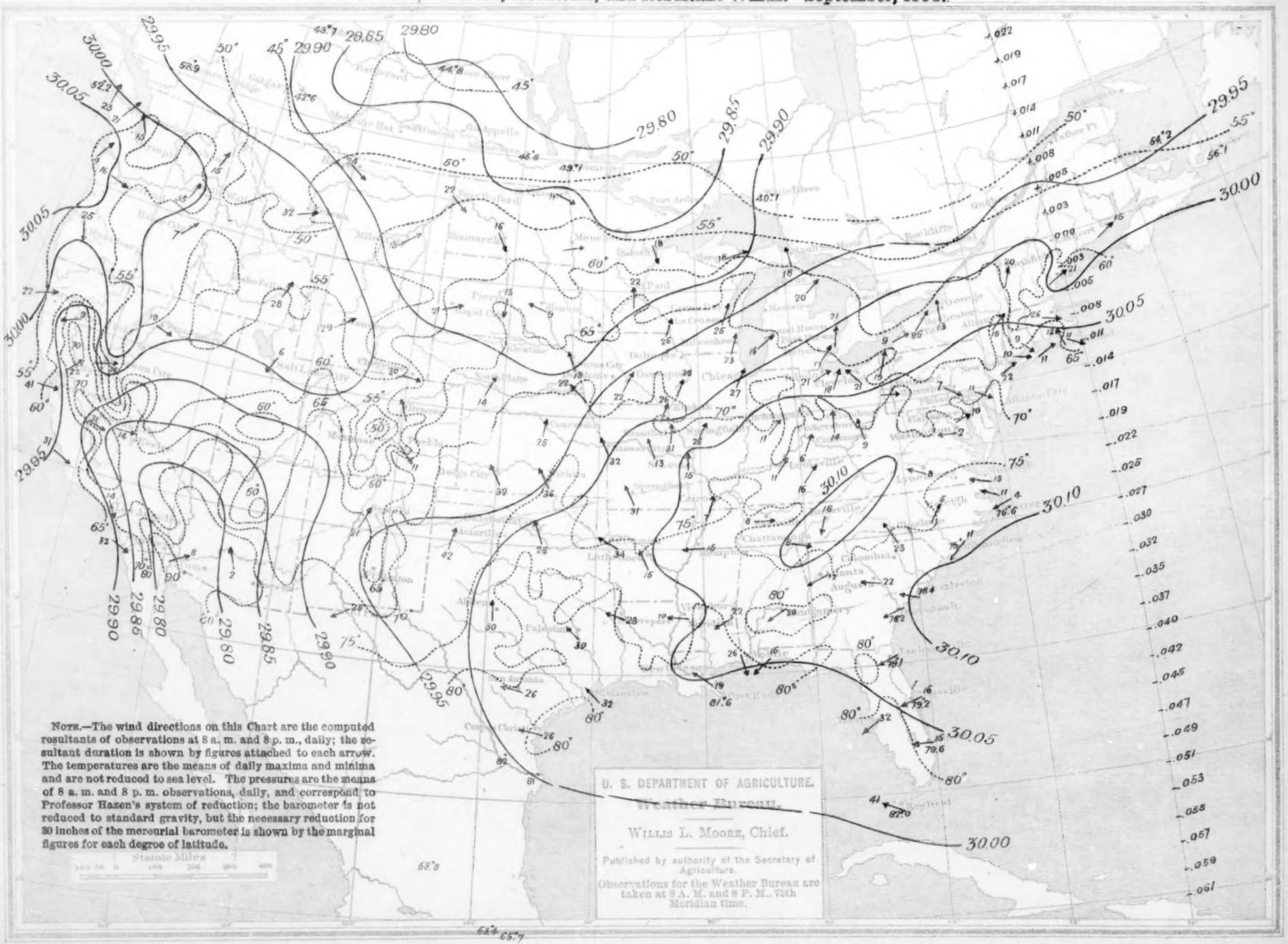
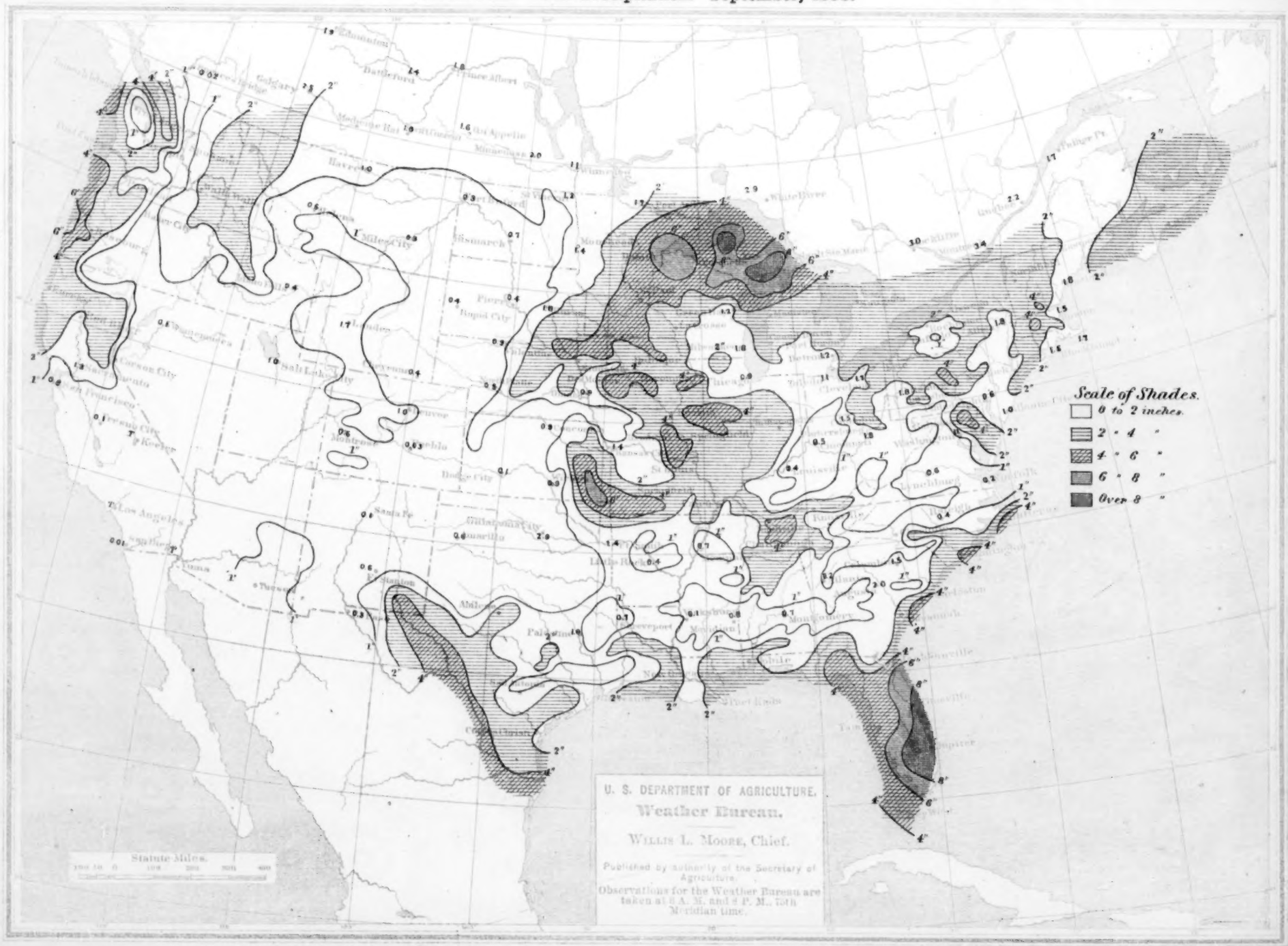
Chart II. Isobars, Isotherms, and Resultant Winds. September, 1895.



Note.—The wind directions on this Chart are the computed resultants of observations at 8 a. m. and 8 p. m., daily; the resultant duration is shown by figures attached to each arrow. The temperatures are the means of daily maxima and minima and are not reduced to sea level. The pressures are the means of 8 a. m. and 8 p. m. observations, daily, and correspond to Professor Hazen's system of reduction; the barometer is not reduced to standard gravity, but the necessary reduction for 30 inches of the mercurial barometer is shown by the marginal figures for each degree of latitude.

Chart III. Total Precipitation. September, 1895.


Scale of Shades.
0 to 2 inches.
2 " 4 "
4 " 6 "
6 " 8 "
Over 8 "
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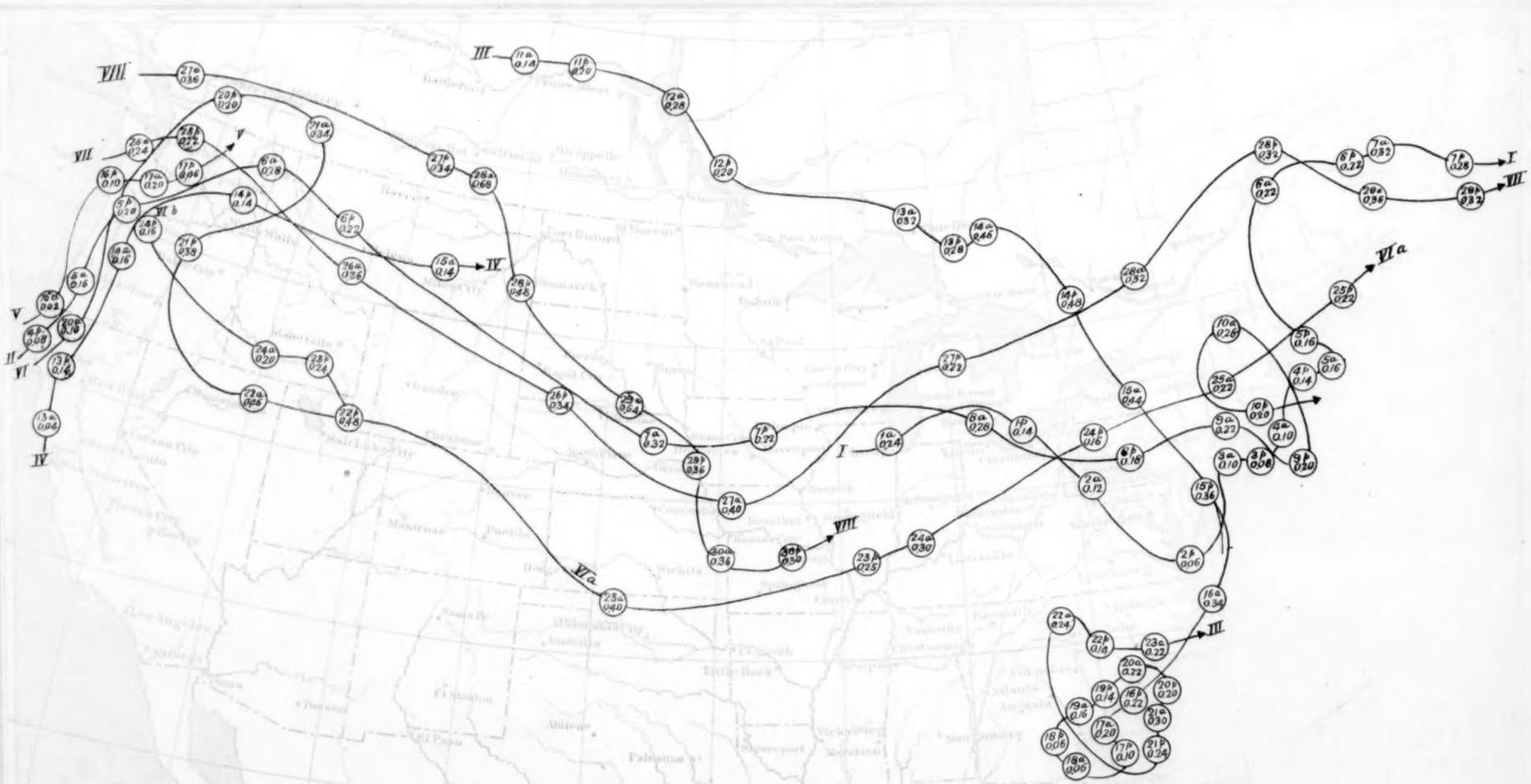
Statute Miles.

Chart IV. Tracks of Centers of High Areas. September, 1895.



NOTES.

The roman letters show number and order of centers of high areas. The figures within the circles show the days of the month; the letters *a* and *p* indicate, respectively, the 8 a. m. and 8 p. m., seventy-fifth meridian time, observations.

The queries (?) on the tracks show that the centers could not be satisfactorily located.

Within each circle is given the highest barometric reading reported near the center. A blank indicates that no reports were available.

A wavy line indicates the axis of a ridge of high pressure.

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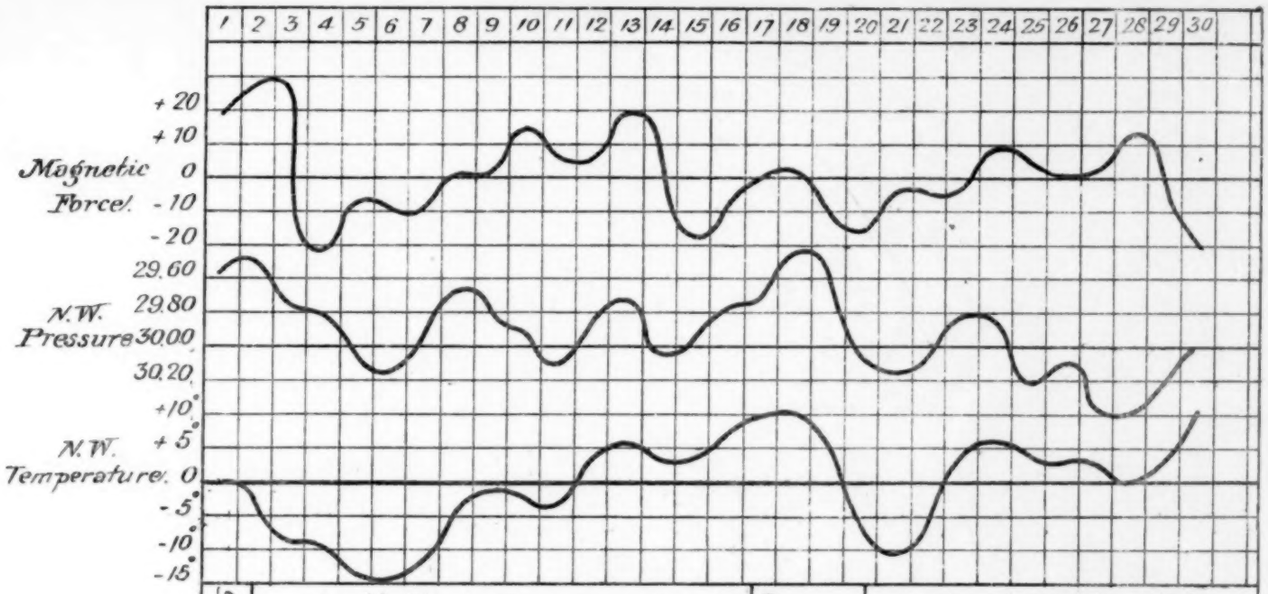
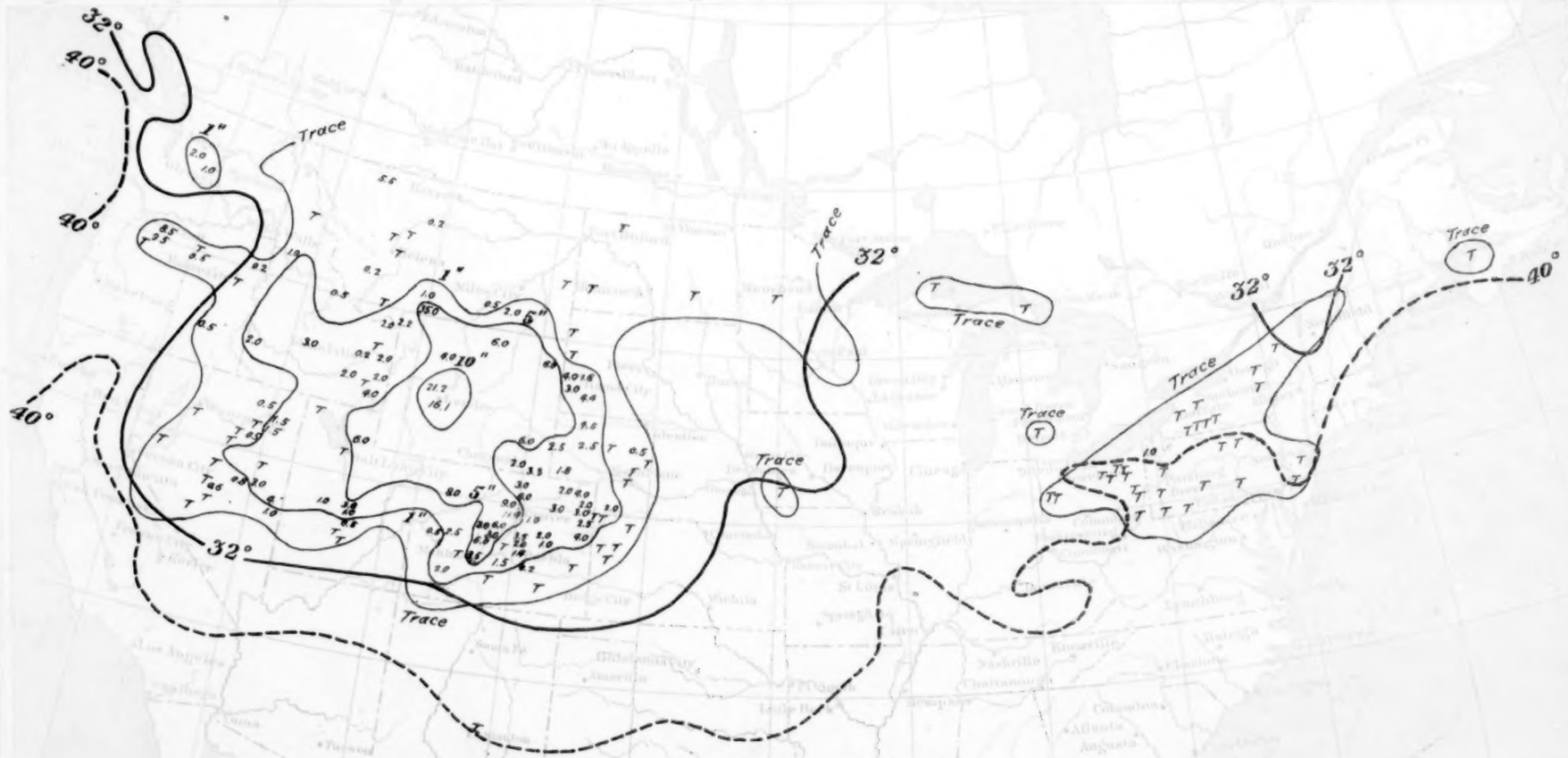
Chart V. Relative Variations of the Horizontal Magnetic Force and the Northwest Pressures and Temperatures.



September 1895	North West Temperatures							Pressure	Horizontal Magnetic Force				
				Variations.							Variations.		
	Calgary	SaltLake Cy.	Williston	Calgary	S.Lake Cy.	Williston	Means-8	10 North West Stations	Toronto	Washington	Toronto	Washington	Means+12
1	63	66	74	+8	+5	+10	0	29.59	435.9	47.8	+3	+10	+19
2	59	67	68	+5	+7	+5	-2	29.52	436.8	48.5	+12	+17	+27
3	50	59	61	-3	0	-1	-9	29.74	437.0	48.7	+14	+19	+29
4	45	59	65	-7	+1	+4	-9	29.82	433.1	42.6	-25	-42	-22
5	43	55	53	-8	-2	-7	-14	30.01	434.3	44.3	-13	-25	-7
6	43	50	52	-7	-6	-7	-15	30.19	434.0	44.1	-16	-27	-10
7	40	53	58	-9	-2	0	-12	29.94	434.0	44.1	-16	-27	-10
8	44	59	69	-4	+5	+12	-4	29.64	434.9	45.1	-7	-17	0
9	47	63	66	0	+10	+10	-1	29.81	435.2	45.6	-10	-12	+1
10	49	56	65	+3	+4	+10	-2	29.91	436.0	47.6	-2	+8	+15
11	47	56	61	+2	+5	+7	-3	30.11	435.0	46.7	-12	-1	+5
12	47	64	70	+3	+14	+17	+3	29.89	435.0	46.8	-12	0	+6
13	50	66	71	+7	+17	+19	+6	29.71	436.4	48.0	+2	+12	+19
14	51	60	63	+9	+12	+12	+3	30.07	435.6	46.4	-6	-4	+7
15	50	56	65	+9	+9	+15	+3	29.97	433.7	43.2	-25	-36	-18
16	49	61	71	+9	+15	+22	+7	29.77	434.6	44.9	-16	-19	-6
17	52	67	66	+13	+22	+18	+10	29.72	435.9	44.9	-3	-19	+1
18	50	65	72	+12	+21	+25	+11	29.43	436.0	45.0	-2	-18	+2
19	45	59	63	+8	+16	+17	+6	29.63	434.6	44.4	-16	-24	-8
20	40	43	46	+4	+1	+1	-6	30.04	434.2	43.3	-20	-35	-16
21	35	36	41	0	-5	-3	-11	30.15	435.9	44.7	-12	-21	-4
22	40	40	49	+6	0	+6	-4	30.06	434.6	44.8	-16	-20	-6
23	46	50	58	+13	+11	+16	+5	29.82	434.8	45.3	-14	-15	-3
24	45	56	55	+13	+18	+14	+7	29.84	436.0	46.4	-2	-4	+9
25	42	54	50	+11	+17	+10	+5	30.22	435.8	45.6	-4	-12	+4
26	42	48	49	+12	+12	+10	+3	30.10	435.4	45.8	-8	-10	+3
27	40	51	45	+11	+16	+7	+3	30.40	435.6	45.7	-6	-11	+3
28	39	47	38	+11	+13	+1	0	30.40	436.8	46.6	+6	-2	+14
29	42	47	44	+15	+14	+8	+4	30.13	434.2	45.8	-20	-10	-3
30	46	54	49	+20	+22	+14	+11	30.00	430.3	40.6	-59	-62	-24

Chart VI. Depth of Snowfall and Limits of Freezing Weather. September, 1895.



Total depth of snowfall is shown in inches. (T. = Trace.)

The southern limit of freezing weather is shown by the frost line of minimum 40° F. — — — and by the freezing line of minimum 32° F. ————

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